33 WINDOWS ACCELERATORS • 23 ULTRAFAST FAX-MODEMS

WINDOWS 3.1 TROUBLESHOOTING TIPS

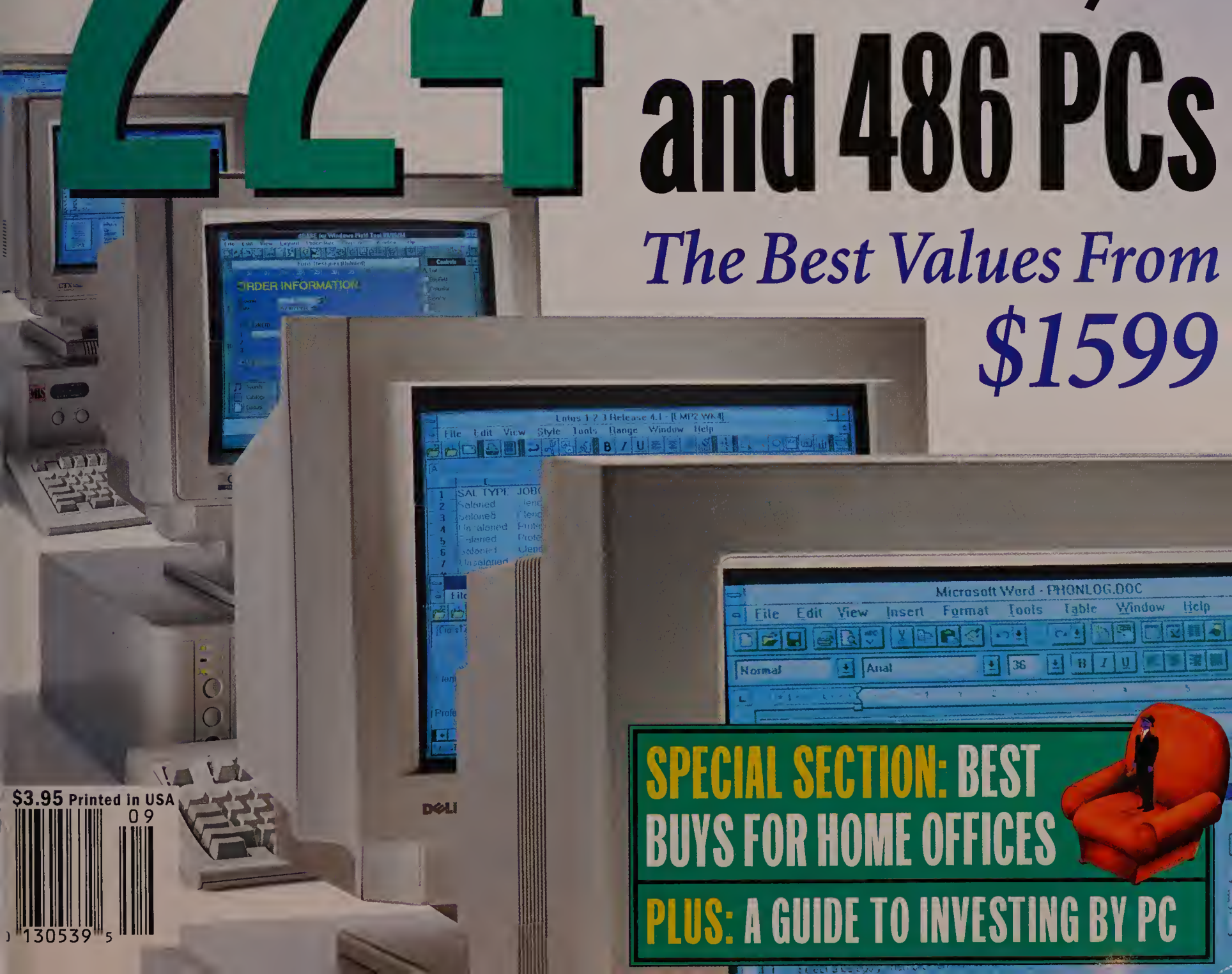
PC WORLD

September 1994

SUPER ROUNDUP!

224 Pentiums, DX4-100s, and 486 PCs

The Best Values From $1599



SPECIAL SECTION: BEST BUYS FOR HOME OFFICES

PLUS: A GUIDE TO INVESTING BY PC

$3.95 Printed in USA
09
130539 5

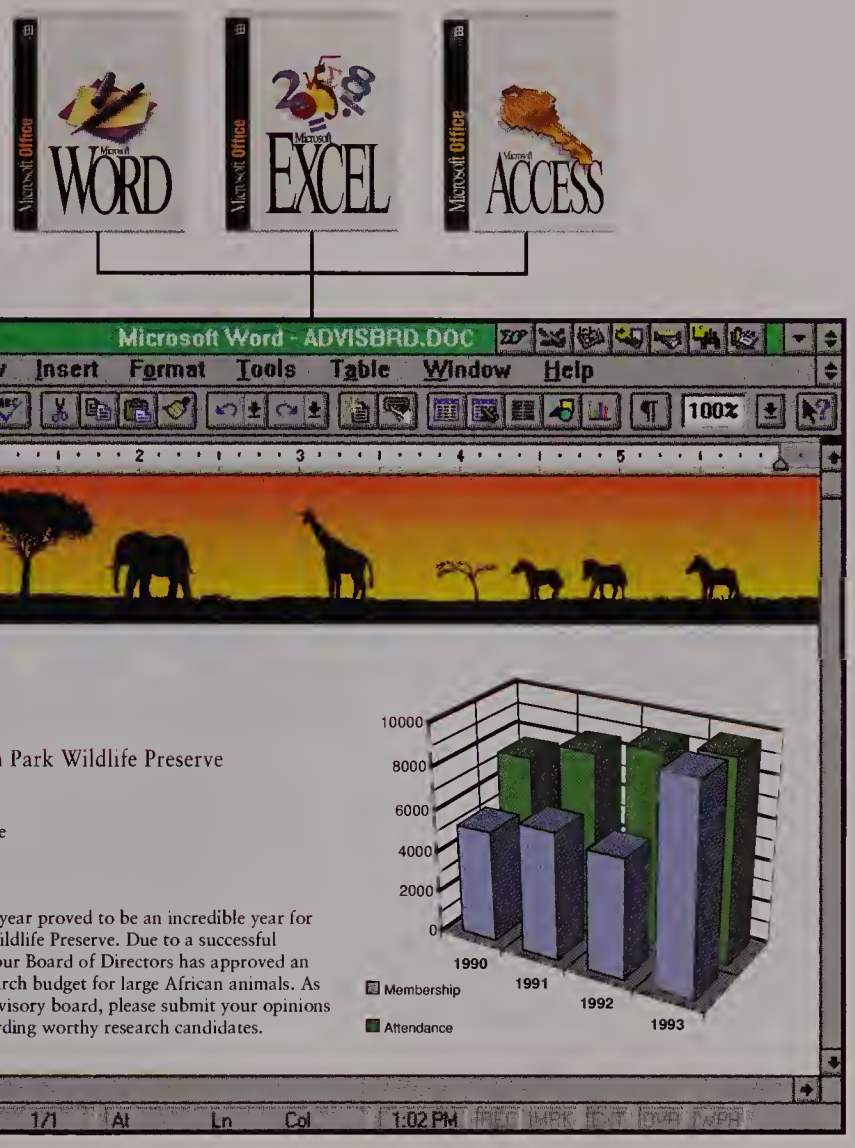
IN THE MICROSOFT OFFICE, S
JUST COHABIT, THEY FORM M

You might say we simply borrowed the idea from nature. Programs that live in the same place should work together.

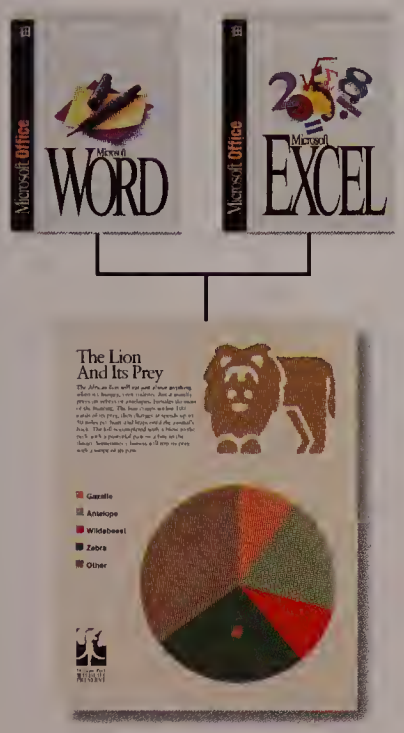
Consider what you have to do in a single week. Letters. Memos. Reports. Spreadsheets. Charts. Graphs. Presentations. Wouldn't it be great if there were a product that could help you pull it all together?

In a nutshell, that's the idea behind the Microsoft® Office.

Now all your programs can work together like one. Thanks



It's easy to update or manage text, data and graphics in one document with the latest object linking and embedding technology (OLE 2.0). Just click where you need to work and the tools you need are right there.



Now it's simple to combine information from different programs. So you can spice up a flyer with, say, a Microsoft Excel chart.

to our intuitive OfficeLinks tools, you can now share text, data and graphics seamlessly between our best-selling programs.

What's this really mean?

Simply, you'll be able to get more done. With a lot less effort.

Say you're working on a sales report. You'll probably start by writing in Microsoft Word.

Then you click to open your Microsoft Access® database and call up your sales data. By region. By salesperson. By month. By client. By vendor.

But why stop there?

You can easily send that data to a Microsoft Excel spreadsheet in just a click of a button, analyze it, turn it into a dramatic

*Support for Microsoft Office is no-charge; however, normal telephone company charges apply. Microsoft support services are subject to Microsoft's then-current prices, terms, and conditions, which are subject to change without not and a Mail workstation license (server and software must be acquired separately). In the 50 United States, call (800) 894-6642, Dept. VAC. For information only: In Canada, call (800) 563-9048; outside the U.S. and Canada, call y ar l PowerPoint, Microsoft Access and the Windows logo are registered trademarks of Microsoft Corporation.

OFTWARE PROGRAMS DON'T MEANINGFUL RELATIONSHIPS.

chart, and drop it all back into your Word document.

It's like one big technological swap fest. The end benefit being, you can concentrate on your work, instead of your software.

Naturally, you'll want to share your handiwork with the regional managers. Just a couple of clicks later, you've created personalized letters for each one of them from within Microsoft Word. Brilliant.

One final touch. Click a

presentation. Call it a "career-enhancing" move.

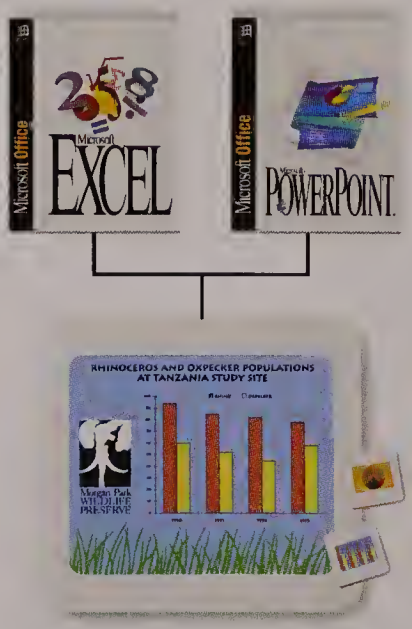
And while we're on the subject of relationships, we should mention the Microsoft Office is the only product of its kind that has unlimited product support with no service charge.*

Clearly, Microsoft Office with OfficeLinks marks a quantum shift in what software enables you to achieve. And it's a clear indication of where the future is heading.

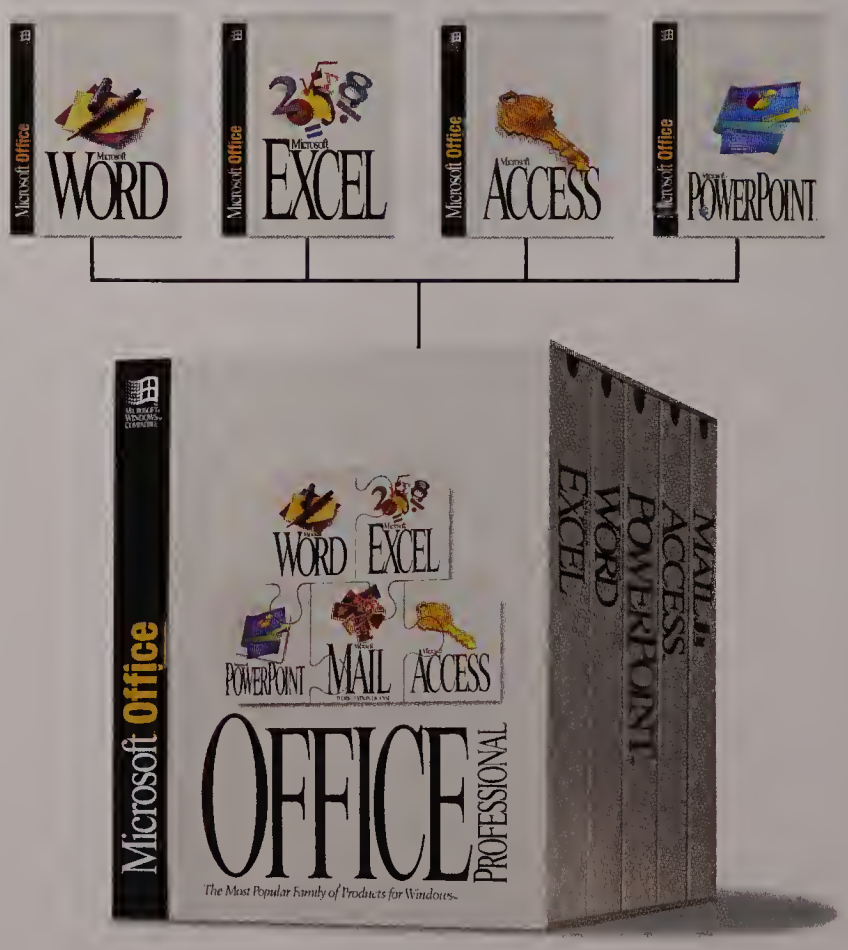
To find out the rest of the story (a small sample of which we've covered here), visit your retailer or call (800) 894-6642, Dept. VAC, for your Office Information Kit.

With the Microsoft Office, you'll not only improve the relationship between your programs, the same will go for you and your computer.

Microsoft Office



Create powerful presentations easily with information from different programs. Suddenly, you're a whiz presenter.



button and transform everything into an eye-popping PowerPoint®

ce. 994 Microsoft Corporation. All rights reserved. Microsoft Office Professional, shown here, includes: Microsoft Excel, Word, the PowerPoint presentation graphics program, the Microsoft Access database management system eal M soft subsidiary or (206) 936-8661. Customers who are deaf or hard of hearing can reach Microsoft text telephone (TT/TDD) services by calling (800) 892-5234 in the United States or (905) 568-9641 in Canada. Microsoft,

THEY SHARE.
THEY COMPLEMENT
EACH OTHER.
THEY GIVE AND TAKE.

Buying a system? Sure, you want price and performance. Support? Too often it's an afterthought.

Problem is, too many direct-order companies treat support the same way. They make the sale, then disappear.

At AMBRA,™ we'd rather build a long-term relationship with our customers. So before we sold a single PC, we enlisted the best service organization in the business: IBM.®

Whenever you need help, we've got IBM computer experts–not switchboard operators–standing by. Toll-free, 24 hours a day, 7 days a week. And, every system carries one-year IBM onsite technical service.

It's for reasons like these that *InfoWorld* (4/25/94) says, "AMBRA has been able to offer good support and customer service as well as good prices."

All good reasons to buy from AMBRA.

THE AMBRA ASSURANCE

- *Toll-free IBM technical support, available 24 hours, 7 days a week.*
- *30-day, airtight, money-back guarantee.*
- *One-year warranty on parts and labor.*
- *All Blue Lightning™ systems are rigorously tested.*
- *XXCAL Gold Certification Program.*

AMBRA

100MHz AT

IBM BLUE LIGHTNING:

Your Windows™ apps need speed, while you need something to fit your budget.

Here's a solution that's a bolt from the blue: the D4100BL from AMBRA.

It takes advantage of IBM's Blue Lightning 100MHz processor. With clock-tripling technology, it boosts speed without heating up the price.

PC World named our 66MHz Blue Lightning a "Best Buy." Guess that makes our 100MHz an even *better* best buy.

You want one, you better get on the horn. They're going as fast as they run.

D466BL *NOW* **$1399**
Business Lease: $49/Month

- ▲ 486/66MHz Blue Lightning
- ▲ Upgradable to Pentium™ Technology
- ▲ 16KB L1 and 256KB L2 Cache
- ▲ 4MB RAM, Max: 64MB
- ▲ 212MB Enhanced IDE Caviar™ Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA® Local Bus Graphics Accelerator 1MB
- ▲ Integrated 32-bit SCSI-2 Controller
- ▲ 3 16-bit ISA and 2 32-bit VESA Bus Slots
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ 5 Drive Bays
- ▲ Integrated Ethernet-10BaseT
- ▲ Lexmark™ 101-Key Keyboard
- ▲ MS-DOS® 6.2, Windows 3.1, Mouse

D4100BL *NOW* **$1699**
Business Lease: $60/Month

- ▲ 486/100MHz Blue Lightning
- ▲ Upgradable to Pentium Technology
- ▲ 16KB L1 and 128KB L2 Cache
- ▲ 4MB RAM, Max: 64MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ Double-Speed Multisession CD-ROM Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA Local Bus Graphics Accelerator 1MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ 4 16-bit ISA and 1 32-bit VL Bus Slots
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ 5 Drive Bays
- ▲ Lexmark 101-Key Keyboard
- ▲ MS-DOS 6.2, Windows 3.1, Mouse

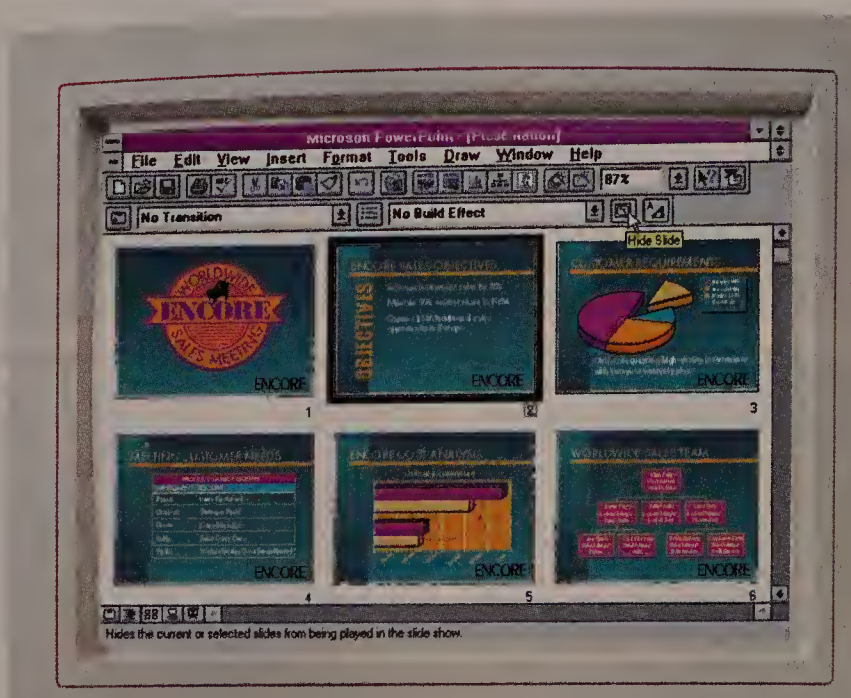
CALL NOW *and get an upgrade on any CD-ROM system to multimedia with 16-bit sound card and 2 stereo speakers for only $49.*

©1994 AMBRA Computer Corporation. The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation. AMBRA is a trademark of ICPI Ltd. and used under license therefrom. All other brands and product names are registered trademarks, trademarks or service marks of their respective holders. Please call for details regarding AMBRA's money-

66MHz Prices.

A Bolt From The Blue.

Winbench 4.0				
	DOSmark	Graphics WinMark	Disk WinMark	Winstone
Blue Lightning 100MHz[1]	719.9	9.76	1243	58.7
486DX2/66 Average[2]	592.7	9.50	861	49.5



D4100BL *NOW* **$2099**

Business Lease: $74/Month

- 486/100MHz Blue Lightning
- Upgradable to Pentium Technology
- 16KB L1 and 256KB L2 Cache
- 8MB RAM, Max: 64MB
- 420MB Enhanced IDE Caviar Hard Disk Drive
- Double-Speed Multisession CD-ROM Drive
- 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- VESA Local Bus Graphics Accelerator 1MB
- VESA Local Bus IDE Hard Drive Controller
- 4 16-bit ISA and 1 32-bit VL Bus Slots
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2, Windows 3.1, Mouse
- Borland Office™ on CD[3] (WordPerfect,® Quattro® Pro, Paradox®)

Desktop model shown. Mini-tower and other configurations also available.

1 800-200-3389

ack guarantee, warranty and credit terms. Lease based on 36 months, offered by IBM Credit Corp. Onsite service may not be available in certain locations. Offerings ıay differ in Canada. Prices do not include shipping. Return shipping and insurance charges are the responsibility of the customer. [1]AMBRA results independently tested /31/94. [2]From *PC Magazine*, December 7, 1993. [3]All manuals are on the CD. Printed manuals can be purchased directly from Borland® and WordPerfect.

AMBRA

PC WORLD

Cover Story

132 Top 20 PCs: Beyond the CPU
You can't judge a PC by its processor. This month, DX4-100s battle Pentiums and 486-66s take on DX4-100s. To find the best values, we tested and rated them all. The champs: Dell's Dimension XPS 90, Diamond's DT 486-66, AT&T's Globalyst 200, and IBM's ThinkPad 500. Plus, complete rankings of 224 PCs, from SX-25s to Pentium-90s.

Special Report: Small Office/Home Office

230 The Savvy Shopper
Where's the best place to buy a new PC? Our undercover shopper explored the warehouses and malls of America. Here's his advice.

239 Top Picks for the Home Office
These are a few of our favorite things.

243 Great Communicators
Business phone strategies that will keep customers from hanging up.

Cover photography by Robert Cardin, digital composition by TX Unlimited/San Francisco

Graphics

172 Speed Demons: Top Windows Accelerators
Whether it's to put some zip into Windows or power up for heavy graphics or multimedia work, a new generation of accelerators gives your PC the assist it needs. We tested 33 graphics boards and named Best Buys for mainstream as well as multimedia applications.

Fax-Modems

190 The Right Connections
We tested 23 fax-modems to find the best for combining fast online communications with automated fax transmission. From high-speed Internet surfing to paperless faxing, our Best Buys will hook you up just right for under $150.

Investing

206 15 Ways to Leave Your Broker
When your full-service broker talks, do you still listen? PC software and online services are now available for investors, from bewildered beginners to experienced mutual-fund hobbyists. We bring you advice from the experts and review leading software and services.

Top of the News

58 The Cyrix Advantage: A Better DX2-66
More powerful than a DX2-50, cheaper than a DX4-75—Epson's notebook, the first to use Cyrix's Cx486DX2-V66, is the lightest 66-MHz mobile PC we've ever tested.

61 Close-Up Telecommuting
Norton-Lambert's $199 Close-Up 6.0 synchronizes directories to make remote computing easy for telecommuters.

62 How to Make Your PC Listen
Talk to your PC and watch it respond. Kurzweil 1.0 for Windows is a cost-effective voice recognition keyboard replacement.

64 Making the Best of Peer Connections
Peer-to-peer nets give you the advantages of LANs without the hassle. Here's how to get connected and what to buy.

VOLUME 12
NUMBER 9

p. 172

Networking

72 Manage Your Group's Documents
PC Docs and SoftSolutions give your group control over critical documents.

76 Struggling to Make Work Flow Work
This Notes-based work-flow system offers a major payoff—but not without a major struggle.

Reliability and Service

170 Win a Pentium-66 PC
How satisfied are you with your PC? Whether it's trouble-plagued or trouble-free, tell us about it. Fill out and fax in this month's survey for a chance to win a Zeos Pantera 66, a Best Buy PC from September's Top 20 charts.

Windows

219 Windows Detective: Solving the Mysteries of Error Messages
They appear out of nowhere, without reason, devouring documents and disrupting work. Error messages have terrorized anyone who's ever used a Windows PC. Here's a definitive guide to what those messages mean and what to do about them.

p. 190

New Products

95 Ascentia 900N and 800N notebooks; Bravo MS, AST Premmia MX and GX desktop PCs

96 Epson Stylus Color and DECcolorwriter 520ic ink jet printers

98 Toshiba T3600CT, T2400CT, T2400CS, T1960CT, T1960CS notebooks

98 Dell Dimension XPS MT Pentium minitower

102 Select-Ease keyboard

102 ArtPad and Penmouse pen tablets

106 Photoshop 3.0, Micrografx Picture Publisher 5.0

107 Peachtree Accounting 3.0 for Windows

107 NoMouse 5.0 for Windows emulation software

108 Borland Sidekick 1.0 for Windows personal information manager

108 Lotus Forms 1.0 for Windows

117 SelectPhone CD ROM

117 CompuServeCD

120 GroupWise 4.1 electronic mail and groupware

120 Eclipse Fax 6.0

121 CaLANdar 3.0 group scheduler

121 Coactive Connector 2.0 cross-platform system

122 Quick Takes

Here's How

254 Help Line

258 Spreadsheets

262 Word Processing

266 Windows

274 Data Management

278 Publishing & Presentations

280 Communications

282 Hardware

286 Star-Dot-Star

Departments

15 In This Issue

19 Letters

30 Consumer Watch

43 Real Problems, Real Solutions

51 Inside Source

321 Break Time

324 Home Office

Resources

10 How to Contact PC World

288 PC World Catalog

299 Mail-Order Shopping Guide

317 Advertiser Index

319 Editorial Product Index

322 Coming Up

IDG INTERNATIONAL DATA GROUP

PC World™ (ISSN 0737-8939) is published monthly at $29.90 for one year (12 issues), $59.80 for two years (24 issues), $89.70 for three years (36 issues) by PC World Communications, Inc., 501 Second St. #600, San Francisco, CA 94107. Foreign orders must be prepaid in U.S. funds with additional postage. Add $18 per year for Canada and Mexico; add $46 per year for airmail for all other countries. Canadian GST Registration #R124669680. Second-class postage paid at San Francisco and additional mailing offices. Canada Post International Publications Mail Product, (Canadian Distribution) Sales Agreement No. 0463566. POSTMASTER: Send address changes to *PC World*, Subscription Dept., P.O. Box 55029, Boulder, CO 80322-5029. Editorial and business offices: 501 Second St. #600, San Francisco, CA 94107, 415/243-0500. Copyright © 1994, PC World Communications, Inc. All rights reserved. The trademark *PC World* is owned by International Data Group and used under license by PC World Communications, Inc. *Consumer Watch* and *Star-Dot-Star* are trademarks of PC World Communications, Inc. Printed in the United States.

Get Your Editors' Best Buy, Top Choice,

EXPERTS NAME THE ZEOS® PANTERA™ #1

April 12, 1994 · May 1994 · June 1994 · June & August 1994

"Rocket fast performance and a great price make this our favorite Pentium of the lot," *PC/Computing* said.

Top computer experts at seven leading publications agree that the ZEOS Pantera is the best Pentium-processor based system available.

The ZEOS Pantera has earned:

- *PC Magazine* Editors' Choice (April 12, 1994)
- *Computer Shopper* "top choice" (April & August 1994)
- *PC/Computing* BEST (May 1994)
- *PC World* Best Buy (June 1994)
- *Windows Sources* Experts' Pick (June & August 1994)

These prestigious awards all add up to one thing–ZEOS computers are your #1 choice.

Don't settle for less. The Pantera has it all. *PC/Computing* concurs: "Hot performance, room for expandability, and a low price make this system our top choice."

POWER BEYOND POWER

"At the top is the new ZEOS Pantera-66, a Pentium-66 that recorded the fastest benchmark results ever to come out of the PC World Test Center," reported *PC World.*

PC Magazine said: "ZEOS Pantera-66 combines quality features, good price, and high performance.... A consistently above-average performer on all our benchmark tests...."

The ZEOS Pantera received the highest marks on many benchmark tests including the important Graphics WinMark and Disk WinMark tests run by *PC Magazine.* In fact, its Disk WinMark surpassed the next closest competitor by 35 percent!

What makes the Pantera fly at supersonic speeds? A ZEOS designed motherboard with exceptional features such as a hot new integrated PCI Local Bus IDE Controller (supporting up to four IDE devices) that, as *PC Magazine* said, "pushes disk access into new territory."

PENTIUM & 486 PANTERAS

June 28, 1994

Even better, we now incorporate the latest award-winning Pantera technology (including PCI) to our 486 PCs. The expanded Pantera line includes more processors–from a 486SX-25 to a DX4-100 all the way to a Pentium-90! The best news: The Pantera DX4-100 also earned *PC Magazine*'s Editors' Choice (June 28, 1994).

These new, improved and even more affordable systems feature local bus IDE hard drives from 214MB to 1GB; memory from 4MB to 24MB; a new 64-bit video controller; 3 PCI slots (one contains our PCI local bus video card) in addition to 5 ISA slots; and on-board Fast SCSI-2 option. And all Pantera systems are 100% compatible with every major network operating system on the market.

yes It runs with NetWare

ALL THE EXTRAS INCLUDED

What's more, we give you all this at a marvelous price. There's no doubt about it. *PC/Computing* said: "We suggest you spend your money on this machine–it offers the best value of any system we tested." *Windows Sources* agrees: "ZEOS Pantera offers the best performance for the price."

The value doesn't stop with your purchase. You get the best service and support in the business. In fact, no company has won more *PC Magazine* Readers' Choice for Service & Reliability awards than ZEOS–six in all. And we were the first to provide 24-hour toll-free technical support–every day!

ZEOS offers you all this and more. It's easy to see why the Pantera is the "number one power desktop Best Buy." It's the Editors' Choice. Make it your choice. As *PC/Computing* said, "there's no doubt which machine you should choose: ZEOS's Pantera...this is a deal you simply can't pass up." Call your ZEOS Systems Consultant now at 800-554-5220.

Choice, Experts' Pick, BEST ZEOS® PC Now!

PROCESSORS	PACKAGE 1	PACKAGE 2	PACKAGE 3	PACKAGE 4
486SX-33	**$1495** Lease $63/mo.	**$1795** Lease $65/mo.	**$2295** Lease $83/mo.	**$2845** Lease $103/mo.
486DX-33	**$1645** Lease $60/mo.	**$1945** Lease $70/mo.	**$2445** Lease $89/mo.	**$2995** Lease $108/mo.
486DX2-66	**$1745** Lease $63/mo.	**$2045** Lease $74/mo.	**$2545** Lease $92/mo.	**$3095** Lease $102/mo.
DX4-100	**$1995** Lease $72/mo.	**$2295** Lease $83/mo.	**$2795** Lease $101/mo.	**$3345** Lease $110/mo.
PENTIUM-60	**$1995** Lease $72/mo.	**$2295** Lease $83/mo.	**$2795** Lease $101/mo.	**$3345** Lease $110/mo.
PENTIUM-66	**$2095** Lease $76/mo.	**$2395** Lease $87/mo.	**$2895** Lease $105/mo.	**$3445** Lease $114/mo.
PENTIUM-90	**$2395** Lease $87/mo.	**$2695** Lease $98/mo.	**$3195** Lease $105/mo.	**$3745** Lease $124/mo.
More processors available. Call for details.	■ 4MB RAM	■ 8MB RAM	■ 16MB RAM	■ 24MB RAM
STANDARD WITH EVERY ZEOS PANTERA™ SYSTEM	■ 214MB local bus IDE hard drive w/32K cache	■ 528MB local bus IDE hard drive w/256K cache	■ 720MB local bus IDE hard drive w/128K cache	■ 1GB local bus IDE hard drive w/256K cache
■ Genuine Intel Processor.	■ 3.5" 1.44MB floppy drive	■ 2X CD-ROM drive, 3.5" 1.44MB floppy	■ 2X CD-ROM drive, 3.5" 1.44MB floppy	■ 2X CD-ROM drive, 3.5" 1.44MB floppy
■ PCI local bus color graphics card upgradable to 2MB.	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM
■ Two high-speed serial ports and one enhanced parallel port.	■ ZEOS 14" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch	■ ZEOS 14" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch	■ **ZEOS 15**" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch	■ **ZEOS 15**" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch
■ Three PCI slots and five ISA slots.	■ Six-bay desktop case with two cooling fans	■ Six-bay desktop case with two cooling fans	■ Six-bay desktop case with two cooling fans	■ Six-bay desktop case with two cooling fans
■ Optional on-board Fast SCSI-2 socket.	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse
■ Flash BIOS.			■ Choice of Lotus Windows application	■ Choice of Lotus Windows application
■ 200 watt power supply with built-in surge suppressor. Switchable between 115/230V.				
■ ZEOS 101-key space-saving keyboard.				
■ FCC Certified Class B; UL Listed.				
■ Complete ZEOS Customer Satisfaction Package.				

PENTIUM EXTRAS:
- RAM expandable to 192MB.
- Integrated business audio.

486 EXTRAS:
- RAM expandable to 128MB.
- EPA Energy Star compliant.

FAVORITE OPTIONS

528MB TO 1GB HDD UPGRADE **$295**

1MB TO 2MB VIDEO RAM UPGRADE **$59**

DIAMOND STEALTH 64/PCI VIDEO CARD WITH 2MB VRAM **$249**

UPGRADE FROM A 14" TO A 15" MONITOR
ZEOS SVGA NI, 1024 x 768, flat screen **$95**

UPGRADE FROM A 15" TO A 17" MONITOR
ZEOS SVGA NI, 1280 x 1024 ..... **$395**

ADAPTEC 6360 SCSI CONTROLLER CHIP
For on-board SCSI. Includes drivers **$49**

14.4 BPS V.32 BIS MODEM WITH 14.4 BPS SEND/RECEIVE FAX **$129**

96/48/24 V.42 BIS SEND/RECEIVE FAX MODEM **$49**

INTERNAL TAPE BACKUP
80 to 250MB (with compression), includes backup software **$159**

10-BAY VERTICAL CASE **$95**

MULTIMEDIA UPGRADE
16-bit sound card. Stereo speakers **$148**

LOTUS SMARTSUITE UPGRADE
Five Windows applications in one box! **$299**

Many other affordable upgrades and options available. Call for details!

Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders: Government: 800-245-2449, Outside U.S. and Canada: 612-362-1212. Purchase Orders, MasterCard, VISA, Am Ex, Discover, Z-Card℠, COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

CALL NOW TOLL FREE
800-554-5220

ZEOS® INTERNATIONAL, LTD.

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease; 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. The Energy Star emblem does not represent EPA endorsement of any product or service. All products and company names are trademarks or registered trademarks of their respective holders. Intel Inside and Pentium are trademarks of Intel Corporation. ZEOS is a registered trademark; Z-Card and Computers Now! are registered servicemarks; Pantera is a trademark of ZEOS International Ltd. © 1994 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS). PAN-PCW-9409

Circle 142 on reader service card

PC WORLD

EDITOR IN CHIEF Philip Lemmons

EDITOR Cathryn Baskin
EXECUTIVE EDITOR Russell Glitman
MANAGING EDITOR Luis Camus
ART DIRECTOR Robert Kanes

SENIOR EDITORS
Features Steve Fox
Consumer Issues Roberta Furger
Reviews Owen Linderholm
News Joe Abemathy

SENIOR TECHNICAL EDITOR Karl Koessel
EAST COAST EDITOR Randy Ross

EDITORIAL
Assistant Managing Editor Anne Kandra
Associate Editors Jeff Bertolucci, Rex Farrance, Bryan Hastings, Michael S. Lasky, Dan Miller, Lincoln Spector, Christina Wood
Assistant Editors Michael Desmond, John Goddard, Anita Hamilton, Melissa Riofrio
Assistant Technical Editor Shane Rau
Asst. Editor, East Coast Laurianne McLaughlin
Editorial Assistant Caroline Jones
Fact Checker Arden M. Hoffman

Copy Chief Richard Johnson
Senior Copy Editors Barbara Lewis, Marla Miyashiro, Peggy Nauts
Copy Editors Stephen Compton, Gail Nelson
Editorial Production Associate Henry Pham

Assistant to the Editor in Chief Ken Blaylock
Administrative Assistants Stephanie Daigre, Heidi Zinsmeister Wolff

Business Manager Scott Danish
Librarian Stella Chan

ART & DESIGN
Associate Art Director Greg Silva
Senior Designers Barbara Adamson, Laura Guenn
Senior Design Associates Tim J Luddy, Carolyn Perot
Senior Designer, Infographics Jeff Berlin
Assistant Designer, Infographics Hope Winslow
Production Artist Marlene Tobias

CONTRIBUTING EDITORS
Anita Amirrezvani, Steve Bass, TJ Byers, George Campbell, David Coursey, Scott Dunn, Bronwyn Fryer, Brett Glass, Michael Goodwin, Judy Heim, Richard Jantz, Eric Knorr, Robert Luhn, Lou Miranda, Celeste Robinson, Richard Scoville, Gene Smarte, Scott Spanbauer, Daniel Tynan

PC WORLD TEST CENTER
Director Gregory Smith
Manager, Performance Testing Ulrike Diehlmann
Manager, Usability Testing Dean Andrews
Senior Analyst Susan Silvius
Test Center Coordinator Mike Salayko

USER GROUP ADVISORY BOARD
Steve Bass, Pasadena IBM Users Group; Roger Bender, Microcomputer Managers Association; Jack Bolton, Atlanta PC User's Group (APCUG); Brian Camenker, Boston Computer Society; Rollie Cole, APCUG; Paul Curtis, APCUG; Mary Dolce, Chicago Computer Society; Sandy Frunzi, Las Vegas PC User Group; Al Harrison, Houston Area League PC Users; David Hoffman, NYPC; Joseph Rigo, NYPC; Irving Samuels, Capital PC User Group

Founder David Bunnell
Founding Editor Andrew Fluegelman

PC WORLD LOTUS EDITION
Executive Editor Eric Bender
Senior Associate Editors Richard Cranford, Ann Kremers, Carrie Thomas
Associate Editors Catherine Kenny, Andrea C. Powers, Carol White

LOTUS EDITION MAILING ADDRESS
77 Franklin St. #300, Boston, MA 02110
Phone: 617/482-8470 Fax: 617/426-0235

LOTUS PUBLISHING CORPORATION
Publisher Craig G. Pierce
Editor in Chief Jennifer J. Smith
Marketing Director Jacqueline L. Migell
Production Manager Andrew Ochrymowych

PC WORLD ONLINE
Publisher Jim Moody (America Online, PCW JimM; CompuServe, 71154,212)
Director of Online Services Dennis Sheridan (America Online, PCW Dennis; CompuServe, 71154,362)
Director of Sales and Marketing Thomas Gewecke (America Online, PCW Thomas; CompuServe, 72520,2165)
Systems Operator Nancy H. Miller (PC World Direct BBS, 415/974-7303)
Administrative Assistant Licia Slimon (America Online, PCW Licia; CompuServe, 71154,767)

PC WORLD COMMUNICATIONS, INC.
President, CEO Patrick Kenealy
Publisher, COO Richard J. Marino
Senior VP, Circulation, Marketing, Research Heather Martin Maier
VP, Director of Advertising Jeff Edman
VP, Manufacturing Linda Manes Goodwin
VP, Human Resources Richard Willoughby
VP, Finance Vicki Peilen

The Ultimate Color Subnotebook. The New ZEOS® Meridian.™

High Quality, Superior Performance & Power Up To 100MHz.

Finally, a color subnotebook that's powerful enough to take anywhere. Travel around the world or to the highest peak. At just four pounds and change, the ZEOS Meridian 400C is the perfect companion and the ultimate color subnotebook!

What makes the Meridian 400C so ideal? Durable, sturdy construction that will travel anywhere, incredible power and performance that will take you to new heights, and more options than a road map. To meet your exact needs, we offer you power, speed and memory choices–genuine Intel 486SX-33, 486DX2-50 or DX4-100 microprocessors; 4 or 8MB RAM user upgradable to 20MB; and IDE hard drives from 175MB to 350MB.

The Meridian includes the latest and hottest features: high-speed local bus video for super-fast video performance; a 7.8" diagonal color backlit screen; two Type II PCMCIA slots for fax/modem, SCSI and sound cards; and an 84-key keyboard with inverted "T" arrow keys and the new integrated TruePoint™ pointing device.

Reach the highest point of notebook computing with the new ZEOS Meridian Subnotebook. There's no limit. With its light weight, super power, awesome performance and technologically-advanced features, you can keep in touch with the office, write memos, organize your calendar and work on priority documents–wherever you are. To get portable power, call a ZEOS Systems Consultant today at 800-554-5220.

STANDARD WITH THE ZEOS MERIDIAN 400C:

- Intel 486SX-33, 486DX2-50 or DX4-100 microprocessor.
- 8K (DX4 only: 16K) internal system cache.
- RAM expandable to 20MB.
- IDE hard drive upgradable to 350MB.
- 2 PCMCIA slots, Type II.
- High-speed local bus video with 1MB video RAM.
- Display: 640 x 480 STN color VGA backlit LCD, 7.8" diagonal, up to 256 colors.
- Supports an external SVGA color monitor, up to 1024 x 768.
- 84-key keyboard with embedded numeric keypad and 12 dedicated function keys, inverted "T".
- Eraser-shaped integrated TruePoint™ pointing device.
- Replaceable, rechargeable NiMH battery.
- Serial port, enhanced parallel port, keyboard or PS/2 mouse port, external VGA port, and external FDD port.
- Full power management features include Low Power mode and programmable Standby features.
- AC-DC adapter with full range from AC 110-240V to DC.
- 7.8" x 10.2" x 1.7"; 4.2 lbs.
- EPA Energy Star compliant.
- FCC Certified Class B; UL Listed.
- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1

486SX-33	**$1995**	Lease $72/month
486DX2-50	**$2195**	Lease $79/month
DX4-100	**$2495**	Lease $90/month

- 4MB RAM
- 175MB IDE hard drive
- MS-DOS 6.2

PACKAGE 2

486SX-33	**$2295**	Lease $83/month
486DX2-50	**$2495**	Lease $90/month
DX4-100	**$2795**	Lease $101/month

- 4MB RAM
- 260MB IDE hard drive
- External 3.5" 1.44MB floppy drive, 9.2 oz.
- Custom carrying case
- MS-DOS 6.2, Microsoft Windows for Workgroups 3.11, Lotus Organizer

PACKAGE 3

486SX-33	**$2595**	Lease $94/month
486DX2-50	**$2795**	Lease $101/month
DX4-100	**$3095**	Lease $102/month

- 8MB RAM
- 350MB IDE hard drive
- External 3.5" 1.44MB floppy disk drive, 9.2 oz.
- Custom carrying case
- Extra battery
- MS-DOS 6.2, Microsoft Windows for Workgroups 3.11, Lotus Organizer

CALL NOW TOLL FREE

800-554-5220

ZEOS INTERNATIONAL, LTD.

Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders: Government: 800-245-2449, Outside U.S. and Canada: 612-362-1212. Purchase Orders, MasterCard, VISA, Discover, Am Ex, Z-Card,℠ COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease: 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. Intel Inside Logo is a trademark of Intel Corporation. ZEOS is a registered trademark; Z-Card and Computers Now! are registered servicemarks; ZEOS Meridian and True Point are trademarks of ZEOS International Ltd. ©1994 ZEOS International LTD., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS)

MERPCW-0409

Circle 193 on reader service card

Kao diskettes are renowned in business circles.

It must be the networking we do.

Novell® demands the ultimate in diskette quality – it chooses Kao. And we make our diskettes right here in the U.S.A. at our state-of-the-planet facilities. Count on Kao diskettes, the professional choice. Call us at **1-800-759-2590.**

KAO
EXTREME QUALITY

Made in the U.S.A.

Novell and NetWare are registered trademarks of Novell Inc.
KAO is a registered trademark of Kao Corporation
© 1993 Kao Infosystems Company

Circle 138 on reader service card

HOW TO CONTACT PC WORLD

MAIL

PC World Editorial, 501 Second St. #600, San Francisco, CA 94107
Phone: 415/243-0500 **Fax:** 415/442-1891
America Online: keyword PC WORLD
CompuServe: GO PWOForum
MCI Mail: PC World Editorial or 179-3813
Internet: letters@pcworld.com

SUBSCRIPTION SERVICES, ADDRESS CHANGES

For *PC World* and *PC World Lotus Edition:* Call toll-free 800/234-3498 (303/447-9330 in Colorado and Canada), or write Subscriber Services, P.O. Box 55029, Boulder, CO 80322-5029. To place new orders, call 800/825-7595.

PC WORLD ONLINE

You can contact the editors electronically on PC World Online via America Online and CompuServe. PC World Online features current and back issues of *PC World* and *PC World Lotus Edition*, a software library, and message boards.

To obtain a free America Online starter kit, call 800/827-6364.

To join PC World Online on CompuServe, set your communications software to 7 data bits, even parity, and 1 stop bit. To find out your local access number, dial 800/346-3247 (modem) and type **Phones** at the Host Name ID prompt. Fill in the requested information. Then dial again using the local access number, and once connected, press **<Enter>**. Fill out the screen as follows:

Host Name: **CIS** User ID: **177000,5605**
Password: **COMPUSERVE** Agreement#: **PCWORLD**
Serial Number: **<Enter>**

If you require further assistance, or if you would like to receive the *PC World* customized interface, call CompuServe customer assistance at 800/848-8990, 800/635-6225 in Canada. Order membership kits after business hours by calling 800/848-8199.

LETTERS TO THE EDITOR

Send editorial correspondence electronically to the Message Board on PC World Online; Internet, letters@pcworld.com; MCI Mail, 666-2936 or PCWLetters; or mail it to *Letters* at *PC World.* Include your name, city, and state. We reserve the right to edit letters.

CONSUMER WATCH

Send consumer-related questions and complaints electronically to the Consumer Watch forum on PC World Online; MCI Mail, PC World Editorial; or mail them to *Consumer Watch* at *PC World.*

REAL PROBLEMS, REAL SOLUTIONS

Send article ideas—including a brief outline of your company, job, problem, and solution as well as your name, address, and phone number—electronically to the Real Problems, Real Solutions forum on PC World Online; CompuServe, 72614,1534; 415/326-4304 (fax); mail them to *Real Problems, Real Solutions* at *PC World;* or call us at 415/978-3212. *PC World* pays $300 per published column.

INSIDE SOURCE

Send editorial correspondence electronically to CompuServe, 76711,23; MCI Mail, PCLETTER; America Online, DCOURSEY; or mail it to *Inside Source* at *PC World.*

HERE'S HOW

Send questions electronically to the appropriate forum on PC World Online (for example, send *Help Line* questions to the Help Line forum) or to the online address below, or mail them to *PC World.* Contact editors at the following addresses:

Help Line: CompuServe, 74055,412; MCI Mail, 179-3813; Internet, rogue@well.sf.ca.us
Spreadsheets: CompuServe, 72341,2727; MCI Mail, 357-4517; Internet, richard_scoville@pcworld.com
Word Processing: CompuServe, 71571,222; MCI Mail, GCAMPBELL; Internet, george_campbell@pcworld.com
Windows: CompuServe, 74055,412; Internet, pcwsdunn@aol.com
OS/2: CompuServe, 73567,471; Internet, lou_miranda@pcworld.com
Data Management: CompuServe, 74055,412; Internet, celeste_robinson@pcworld.com
Publishing & Presentations: MCI Mail, RJANTZ; Internet, richard_jantz@pcworld.com. Mail makeover candidates, preferably clean and unfolded, to *Publishing & Presentations,* Makeovers, at *PC World*
Communications: CompuServe, 75300,713; MCI Mail, 312-7737; GEnie, JUDY.HEIM; Internet, 3127737@mcimail.com
Hardware: MCI Mail, 459-7102; Internet, eric_knorr@pcworld.com
Star-Dot-Star: CompuServe, 74055,412; Internet, rogue@well.sf.ca.us

HOME OFFICE

Send editorial correspondence electronically to the Home Office forum on PC World Online; CompuServe, 71333,130; or mail it to *Home Office* at *PC World.*

READER SUBMISSIONS

Send us your technical problems and solutions. *PC World* pays $25 for each *Power Tip* we publish, $200 to the user group featured in *User Group Tips*, $25 to $200 for *Star-Dot-Star* items, $50 for questions used in the Here's How section, and $200 for items made over in *Publishing & Presentations.* Keep submissions brief (*Power Tips* to 100 words or less); accepted submissions will be acknowledged by payment.

NEW PRODUCT ANNOUNCEMENTS

Address hardware and software press releases to *New Products* at *PC World* or call 415/978-3212.

REPRINTS AND PERMISSIONS

You must have permission before reproducing any material from *PC World* and *PC World Lotus Edition.* To quote from or reprint any portion of any article, or to use artwork or photographs from the magazine, send a written request to *PC World,* Reprints and Permissions, 501 Second St. #600, San Francisco, CA 94107; include a phone number for a fast response. To order reprints of your company's editorial coverage in *PC World* or *PC World Lotus Edition*, call 415/978-3353.

BACK ISSUES

PC World and *PC World Lotus Edition* are available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346; 800/521-0600. Issues and article copies are also available from UMI.

33-MHZ
50-MHZ
66-MHZ

486 pow•e•r•ful af•ford•able con•ser•va•tion graph•i•cal

STARTING AT **$745**

ACCELERATED VIDEO

Thanks to the new ALR Express, the whole relationship between price and performance has just been redefined. Powered by your choice of fast 486SX and 486DX2 microprocessors and fortified with accelerated graphics, the ALR Express flies through Windows™ without hesitation. Even the lowest priced models run at a quick 33-MHz. Yet all this performance is available for less than $750! A perfect home office PC, network node, or general business system, the Express is an ideal match for today's sophisticated desktop publishing/wordprocessing software and graphics oriented spreadsheet programs. Built for long-lasting performance, it offers a single chip upgrade path to higher levels of 486 processing and Pentium™ Overdrive™ technology.

Best of all, the Express is built by ALR. With a roster of recent awards that includes PC World's "Best Buy", 1994, "CADalyst's "Highly Recommended," PC magazines "Editor's Choice," BYTE's "Best of Spring Comdex, 1993," and Le Monde Informatique's "Product of the Year, 1993" ALR systems have become an established favorite among PC specialists and users worldwide.

So come on, find out what all the critics have been raving about. Visit your nearest authorized ALR reseller, and take a look at the new ALR Express and our complete family of award-winning systems and multimedia solutions. For more information call ALR today:

1•800•444•4ALR

ALR can be reached on Compuserve--GO ALR INC

How do you teach an old or new PC new tricks?

mul•ti•me•dia

Install an ALR Digital Express Multimedia Kit! Featuring the same type of commitment to performance and value that's found in our Express systems, this kit will add state-of-the-art multimedia capabilities to your old PC or your new ALR system.

- **Double Speed CD-ROM Drive**
- **16-bit Wavetable Stereo Soundcard with DSP**
- **Speakers**
- **Software**
- **Manuals and Cables**

ALR®
Advanced Logic Research, Inc.

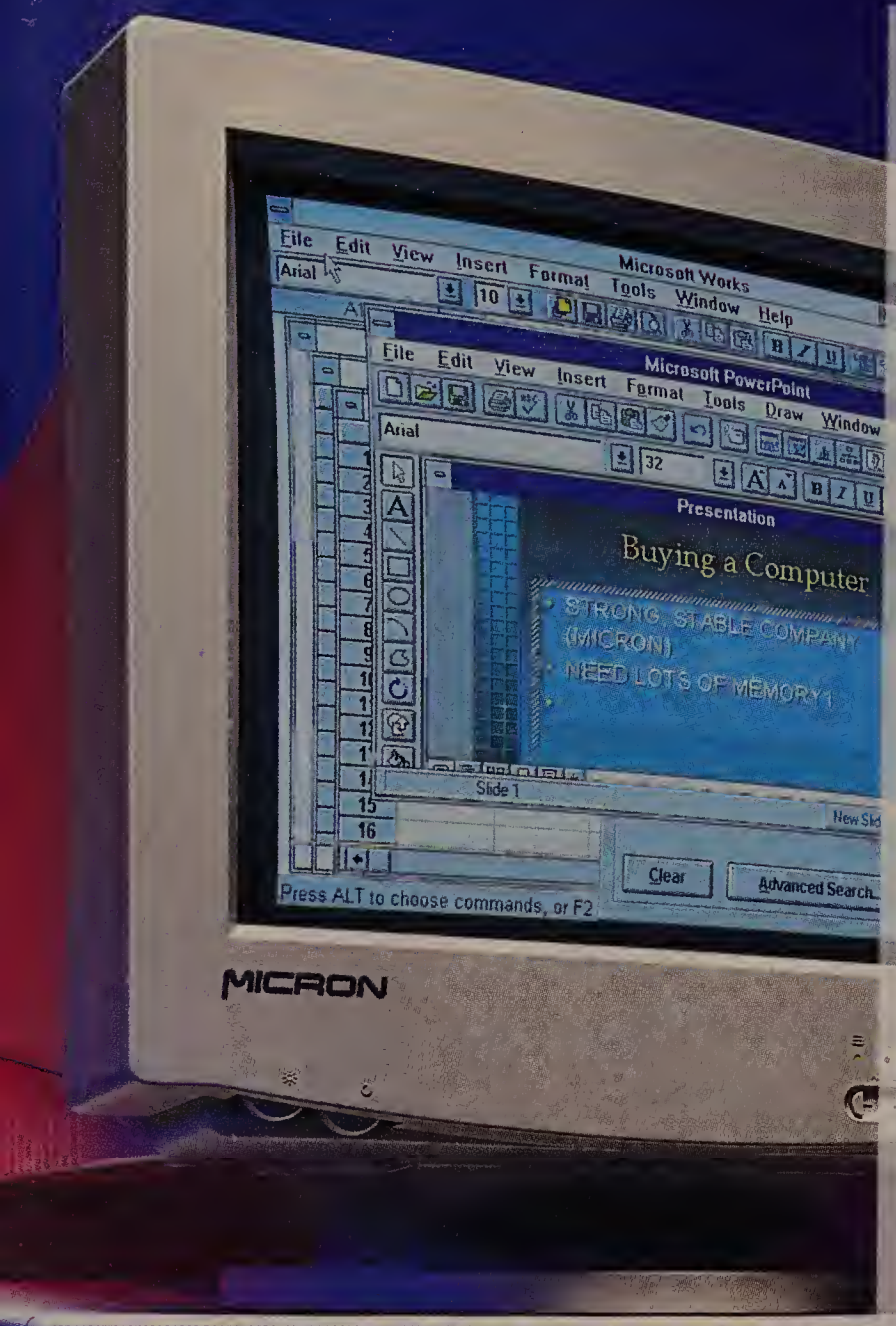
9401 Jeronimo,
Irvine CA 92718
TEL: (714) 581-6770
FAX: (714) 581-9240

System shown with optional monitor and equipment.

Prices, specifications and configurations are subject to change without notice. Prices based on U.S. dollars. ALR is a registered trademark of Advanced Logic Research, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners. ©1994 by ALR

Circle 9 on reader service card

The Expert's Choice....Micron!



P90PCI POWERSTATION

- Intel™ Pentium™ 90MHz processor
- 8MB RAM (expandable to 192MB)
- 420MB 14ms IDE hard drive
- 256K write-back cache (to 512K)
- 4 ISA, 2PCI, 1 ISA/PCI slots, Flash BIOS
- 2X CD-ROM drive, 3.5" floppy drive
- PCI graphics accelerator (2MB)
- 15" Micron 15FGx, 1280NI, .28mm, MPRII
- Desktop"Tool Free"chassis, 3 cooling fans
- Microsoft® Mouse, 101-key keyboard
- MS-DOS® & Windows™ for Workgroups
- Microsoft Office® 4.2 on CD*

$2,799
LEASE - $101/MO.

PC MAGAZINE EDITORS' CHOICE
JUNE 28, 1994
P90PCI POWERSTATION

PCWEEKLABS ANALYST'S CHOICE
JUNE 27, 1994
P90PCI POWERSTATION

SERVICE & RELIABILITY • PC MAGAZINE • READERS' CHOICE
JULY, 1994

- 16MB RAM
- 527MB HD
- 15" Micron 15FGx

$3,099
LEASE - $106/MO.

- 32MB RAM
- 1GB SCSI-2 HD
- 17" Micron 17FGx

$4,599
LEASE - $158/MO.

- 64MB RAM
- 2GB SCSI-2 HD
- 17" Micron 17FGx

$6,499
LEASE - $223/MO.

intel inside
pentium PROCESSOR

Microsoft Office 4.2 on CD with every Micron Pentium!

*MICROSOFT OFFICE DOCUMENTATION ON-LINE. HARD COPY AVAILABLE FOR ADDITIONAL CHARGE.

JULY, 1994

JUNE 28, 1994 P90PCI POWERSTATION

APRIL 26, 1994 466VL MAGNUM

JANUARY 26, 1993 466 MAGNUM

JUNE 27, 1994 P90PCI POWERSTATION

DECEMBER 1993

DECEMBER 1993

JUNE 1994

May 1994

MARCH 1994

SEPTEMBER 1993

MAY 1994

433 MAGNUM LP

- Intel 486SX 33MHz processor
- Pentium Technology Ready (ZIF)
- 4MB RAM (expandable to 48MB)
- 210MB 14ms IDE hard drive
- Local bus graphics (1MB)
- 14" Micron 14G, 1024I, .28mm
- Low profile desktop case
- 5 16-bit ISA slots
- Microsoft Mouse, 101-key keyboard
- MS-DOS & Windows for Workgroups
- Microsoft Works for Windows

$1,199 LEASE - $43/MO.

486 FAMILY MPC

- 2X CD-ROM drive, 3.5" floppy drive
- 16-bit sound card, speakers & joystick
- 9600/2400 Fax/ Modem & WinFax Lite
- Local bus graphics (1MB)
- 14" Micron 14G, 1024I, .28mm
- Low profile desktop case
- Microsoft Mouse, 101-key keyboard
- MS-DOS & Windows for Workgroups
- MS Works Multimedia CD, Encarta 94' CD
- Quicken CD, On-line trial services
- 3 LucasArts CD games: Rebel Assault, Indiana Jones & Day of the Tentacle

- 486SX 33MHz
- 4MB RAM
- 210MB HD

$1,399 LEASE - $51/MO.

- 486DX2 66MHz
- 8MB RAM
- 420MB HD

$1,899 LEASE - $69/MO.

466VL MAGNUM

- Intel 486DX2 66MHz processor
- Pentium Technology Ready (ZIF)
- 8MB RAM (expandable to 64MB)
- 420MB 14ms IDE hard drive (VLB)
- 256K write-back cache, Flash BIOS
- 7 expansion slots: 2 VESA, 7 ISA
- 2X CD-ROM drive, 3.5" floppy drive
- Diamond Speedstar Pro VLB (1MB)
- 14" Micron 14G, 1024I, .28mm
- Desktop "Tool Free" chassis
- EPA Energy Star compliant
- Microsoft Mouse, 101-key keyboard
- MS-DOS & Windows for Workgroups
- Microsoft Works Multimedia on CD*

$1,899 LEASE - $69/MO.

NEW MICRON LOW PROFILE SYSTEMS!

P66PCI POWERSTATION

- Intel 66MHz Pentium processor
- 8MB RAM (expandable to 128MB)
- 420MB 14ms IDE hard drive (PCI)
- 256K write-back cache, Flash BIOS
- 4 ISA, 2PCI, 1 ISA/PCI slots
- 2X CD-ROM drive, 3.5" floppy
- PCI graphics accelerator (2MB)
- 15" Micron 15FGx, 1280NI, .28mm, MPRII
- Desktop "Tool Free" chassis, 3 cooling fans
- Microsoft Mouse, 101-key keyboard
- MS-DOS & Windows for Workgroups
- Microsoft Office 4.2 on CD*

$2,499 LEASE - $90/MO.

- 16MB RAM
- 527MB HD IDE
- 15" Micron 15FGx

$2,799 LEASE - $101/MO.

- 32MB RAM
- 1.0GB SCSI-2 HD
- 17" Micron 17FGx

$4,299 LEASE - $147/MO.

P66PCI POWERSERVER

- Intel 66MHz Pentium processor
- 16MB RAM (expandable to 192MB)
- 527MB 12ms SCSI-2 hard drive
- 512K write-back cache, Flash BIOS
- PCI 32-bit Fast SCSI-2 controller
- 5 EISA, 2PCI, 1 EISA/PCI slots
- 2X SCSI-2 CD-ROM drive, 3.5" floppy
- PCI graphics accelerator (2MB)
- 14" Micron 14G, 1024I, .28mm
- Tower: 10 drive bays, 3 cooling fans
- Microsoft Mouse, 101-key keyboard
- MS-DOS & Windows for Workgroups
- Microsoft Office 4.2 on CD*

$3,699 LEASE - $127/MO.

- 32MB RAM
- 1.0GB SCSI-2 HD
- 15" Micron 15FGx

$4,599 LEASE - $158/MO.

- 64MB RAM
- 2.0GB SCSI-2 HD
- 17" Micron 17FGx

$6,899 LEASE - $237/MO.

466PCI MAGNUM

- Intel 486DX2 66MHz processor
- Pentium Technology Ready (ZIF)
- 8MB RAM, (expandable to 128MB)
- 420MB 14ms IDE hard drive (PCI)
- 256K write-back cache, Flash BIOS
- 4 ISA, 2 PCI, 1 ISA/PCI slots
- 2X CD-ROM drive, 3.5" floppy drive
- PCI graphics accelerator (1MB)
- 14" Micron 14G, 1024I, .28mm
- Desktop "Tool Free" chassis
- Microsoft Mouse, 101-key keyboard
- MS-DOS & Windows for Workgroups
- Microsoft Works Multimedia on CD*

$1,899 LEASE - $69/MO.

- 16MB RAM
- 527MB HD IDE
- 15" Micron 15FGx
- MS Office on CD

$2,499 LEASE - $90/MO.

- Matrox MGA-II 2MB PCI..... add $200
- Matrox MGA-II+ 4MB.....add $500
- Diamond Stealth 64 2MB PCI.....add $200

$200 MULTIMEDIA UPGRADE KIT*

- Sound Blaster 16 sound card & speakers
- Kraft thunderstick joystick
- Microsoft Encarta® 94' CD
- Quicken® CD-ROM Deluxe Edition
- 3 LucasArts CD games: Rebel Assault, Indiana Jones and Day of the Tentacle

*Available with system purchase only

MICRON COMPUTER, INC.

800-223-6571

MON-FRI 7AM - 8PM, SAT 8AM - 5PM(MST) • 915 E. Karcher Road • Nampa, Idaho 83687 • (208) 465-3434 • FAX (208) 465-3424 • Purchase Order FAX (208) 467-5384

©1994 Micron Computer, Inc. All rights reserved. All prices and specifications subject to change without notice. Micron Computer, Inc. cannot be responsible for omissions, errors in typography or photography. Intel, Intel Inside, Pentium end Overdrive ere registered trademarks of the Intel Corporation. Microsoft is a registered trademark and Windows, Windows NT and the Windows logo are trademarks of Microsoft Corporation. The Energy Star emblem does not represent EPA endorsement of any product or service. All other company trademarks are trade names of each respective company. Prices do not include shipping and handling. 30 day risk-free money back guerentee does not include return freight or shipping and handling charges, applies only to Micron brand products, and begins from date ol shipment. All returns require RMA numbers end must be shipped In the onginal condition prepaid end insured. Lease prices based on 36-month lease.

In today's world, your ultimate competitive weapon is who and what you know.

That's why over 600,000 successful people rely on ACT! to manage their relationships.

Make Better Use Of What You Know.

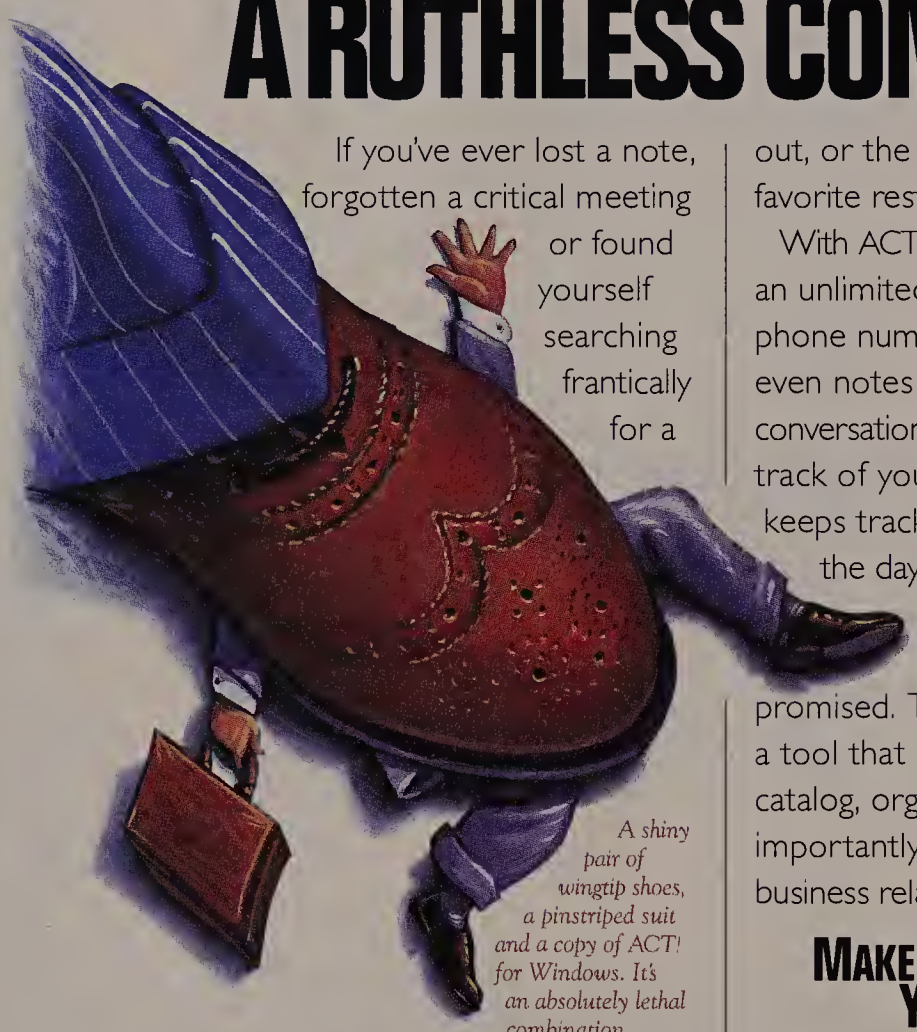
Never again will you be at a loss for the name of your customer's spouse, the date an estimate went out, or the location of a client's favorite restaurant.

With ACT! you can keep track of an unlimited number of contacts, phone numbers and addresses, even notes from your previous conversations. ACT! not only keeps track of your phone numbers, it keeps track of who you called, the day and time you made the call, what was said and exactly what was promised. There has never been a tool that so effectively lets you catalog, organize and, even more importantly, manage every single business relationship you have.

Make Better Use Of Your Time.

Prioritize tasks, schedule an unlimited number of appointments, to-dos, phone calls and recurring events, carry forward incomplete tasks. View your calendar by day, week or month and print it out in over 20 calendar and address book formats. Customize your contact lists and your account histories to meet your individual needs, whatever they may be. You can even share ACT! files with your coworkers over your network.

NEW ACT! IT TURNS A FEW SCRAPS OF PAPER AND A HARMLESS PHONE LIST INTO A RUTHLESS COMPETITIVE WEAPON.



A shiny pair of wingtip shoes, a pinstriped suit and a copy of ACT! for Windows. It's an absolutely lethal combination.

If you've ever lost a note, forgotten a critical meeting or found yourself searching frantically for a phone number, you need new ACT! 2.0 for Windows. ACT! will let you store, retrieve and present an incredible amount of information in virtually any form you like.

And information is a competitive weapon you've simply got to have.

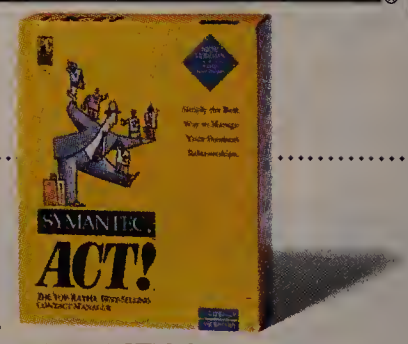
What's more, ACT! manages all of your communications with its own built-in word processor and report generator. So you can create professional correspondence from mail-merged letters and envelopes to customized mailing labels without ever leaving ACT!. It'll even send your electronic mail and faxes for you, too.

Try The #1 Selling Contact Manager Free!

PC Magazine gave ACT! their Editors' Choice Award.* Home Office Computing** gave it four stars. Now it's your turn. You can try a full working copy of ACT! free for 30 days.

So order ACT! now. Or visit your local software store right away.

SYMANTEC.®



TRY ACT! 2.0 ABSOLUTELY FREE FOR 30 DAYS. CALL 1-800-628-4777 EXT. 9224

Try a full working copy of ACT! free for 30 days. All you pay is $9.95 for shipping and handling. Should you choose to keep ACT!, we will charge your credit card $199.95 plus applicable sales tax. Even the call is free. So order now.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

☐ VISA ☐ MASTERCARD ☐ AMERICAN EXPRESS

CREDIT CARD NO._____ EXPIRATION DATE _____

Please attach this order form with payment and allow 4-6 weeks for processing your order. Credit cards only.

Mail to:
Symantec, Attn: ACT! P.O. Box 10849, Eugene, OR 97440-2849

Or Fax To: 1-800-800-1438

Please include applicable sales tax for: AZ, CA, CO, CT, DC, FL, GA, IL, IN, IA, KS, LA, MD, MA, ME, MI, MN, MO, NJ, NC, NY, OH, PA, SC, TN, TX, VA, WA & WI. And applicable local tax for: AZ, CA, FL, GA, NY, OH, SC, TN, TX, WA & WI.

*PC Magazine Editors' Choice Award Aug., 1993. **Home Office Computing, Feb., 1994. Offer valid in U.S.A. only while supplies last. Not valid with any other promotion. Not available to resellers. Shipping and handling costs are non-refundable. SRP for ACT! for Windows is $279.95, for DOS $399 and for Macintosh $249.95. For more information in Canada, call 1-800-667-8661. Symantec and ACT! are registered trademarks of Symantec Corporation. All other trademarks are the property of their respective holders. ©1994 Symantec Corporation. All rights reserved.

A Skeptical Inquiry: 120-MHz Pentiums for $5000?

MICHELE CLEMENT

Skepticism is the trademark of editors. Here at *PC World*, it's our job to listen, question, test, and accurately assess not only PC products on the market now but industry promises of products to come.

During a visit to Intel's offices in Santa Clara, California, early this year, our skepticism kicked into high gear. Intel representatives told *PC World* editors that by the end of the year, PCs would double in performance with no increase in price. While no one disputes Moore's Law—the axiom that processor power doubles every 18 months—the notion of double the power with no price premium in just 12 months had the skeptics among us scoffing.

In dollars and sense, what did this mean? In our February Top 20 review, the top-ranked power desktop, IBM's ValuePoint Pentium-60, earned a performance rating of 80 and sold for about $5000. For Intel's projection to hold true, we'd expect to see PCs with a performance rating of 160 for $5000 or, conversely, a performance rating of 80 for around $2500 in time for next February's Top 20 review.

That level of pure performance is still months away, but price/performance is fast approaching the level that Intel projected. Check this month's cover story, "Top 20 PCs: Beyond the CPU." Micron's DX4-100 earns a performance rating of 80 and sells for $2599. Zeos's Pentium-90 earns a performance rating of 102 and sells for $3595. Clearly, even before year's end, PC price/performance will double.

How Can You Go Wrong?

This leap in price/performance is likely to trigger a new round of capital expenditure requests in corporations across the country. But there's a catch. Look at this month's Top 20 again. Austin's Pentium-66 outperforms two Pentium-90s we tested. NEC's DX4-100 outperforms six Pentium-60s and -66s. Ambra's 486DX2-66 outperforms two Pentium-60s. At one time a PC's processor gave buyers a rough but accurate guide to a system's price/performance, but that simple indicator no longer works. Performance levels and prices, too, are all over the map.

And it won't get easier: New notebook PCs using Cyrix's just-released 486DX2-V66 will try to compete in performance and price with notebooks based on Intel's DX4-75. Cyrix says it will ship new 80-MHz 486 chips soon; desktop PCs using this chip, the company says, will outperform PCs with Intel's 486DX2-66 and cost the same. We expect DX4-100s to be scarce and pricey in upcoming months as companies push Pentium-60s and -66s. Intel will continue to slash prices on Pentium processors and introduce faster DX4s and DX2s that have write-back caches. NexGen should ship its Pentium-compatible CPU soon. The less skeptical among us expect to see user-installable Pentium upgrades by the end of the year. And all the while, Moore's Law continues to operate quietly in the background as Intel, IBM, Motorola, Apple, and Cyrix work on the P6 and P7, the PowerPC, the M1, and other next-generation CPUs.

Sorting Out the CPUs

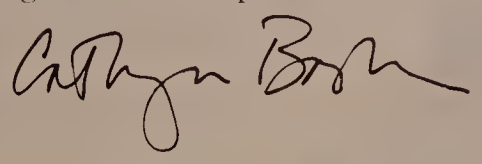
What's a skeptical buyer to do when faced with competing claims about PC price/performance? Consult the *PC World* Top 20. In this month's Top 20 charts, we rank desktop and notebook PCs with no fewer than 16 different CPUs—from a 486SX-25 all the way to Pentium-90s—from chip makers Intel, IBM, and AMD. These Top 20 rankings factor in not only performance but price, resulting in a clear, straightforward guide to value. And this month, as an aid to readers who anticipate buying a new PC this fall, we've supplemented the Top 20 charts with rankings of 224 desktop and notebook PCs—all the systems we've tested that are still on the market since we started the Top 20 charts last February. Consult these expanded rankings if you're considering a particular PC not listed on our Top 20 charts. Starting next month, we'll test an additional 10 systems per month, ranking about 400 PCs by the time next February's Top 20 rolls around.

Now Then, Where to Buy It?

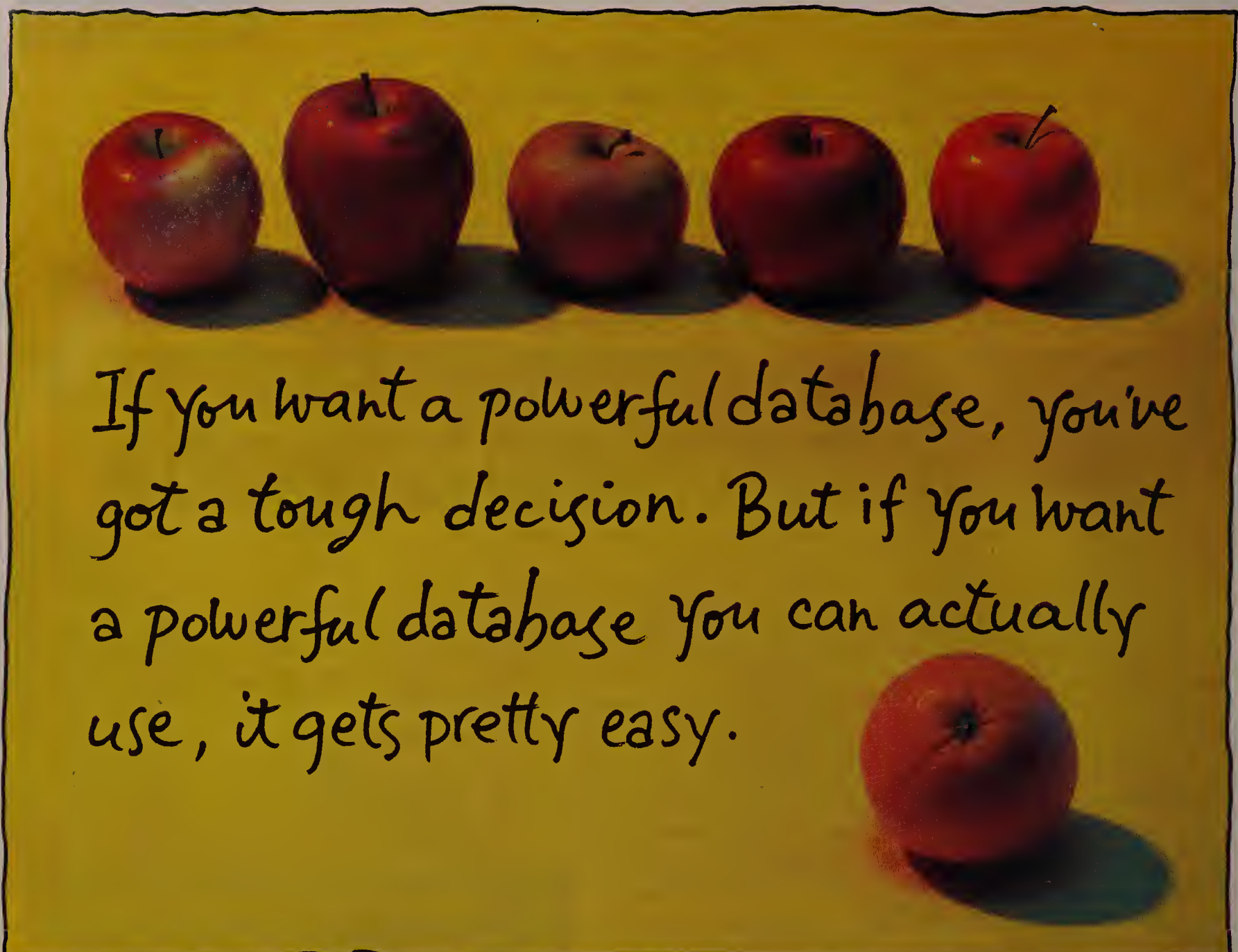
Those fortunate—or unfortunate—enough to have an IS manager responsible for PC purchases are spared the difficult job of deciding where to buy their PCs. But if you own a small business or run a home office, that task falls to you.

Intel predicted that by the end of the year, PCs would double in performance with no increase in price. We scoffed.

This month, in "The Savvy Shopper," Contributing Editor Steve Bass offers his advice. Braving L.A. freeways and plaguing Southern California salespeople for weeks, Steve trudged up and down aisles at CompUSA, Micro Center, Circuit City, Office Depot, Price Club/Costco—even Montgomery Ward and Sears. He evaluated selection, availability, price, service and support options, and the technical know-how of store personnel. Whether you're in the market for a PC, dog food, or Reeboks, his guidance will help.

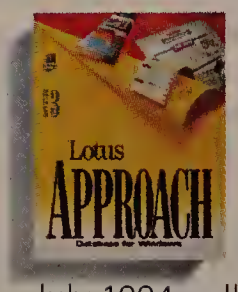


Cathryn Baskin, Editor



What's the difference between apples and oranges? In this case, it's the difference between powerful features and powerful features you can actually use.

Introducing Lotus Approach Release 3.0.



In 1983, Lotus® introduced the world's first approachable spreadsheet. Now we introduce a truly powerful database that's as easy as 1-2-3.® So easy that *PC Computing*, July 1994, calls it "The Amazing Code-Free Database."†

Now you don't have to be a programmer, or even think like one, to build a relational database that brings real efficiency to your work. With the new Approach® 3.0, demanding functions like tracking sales, managing projects, taking orders, invoicing,

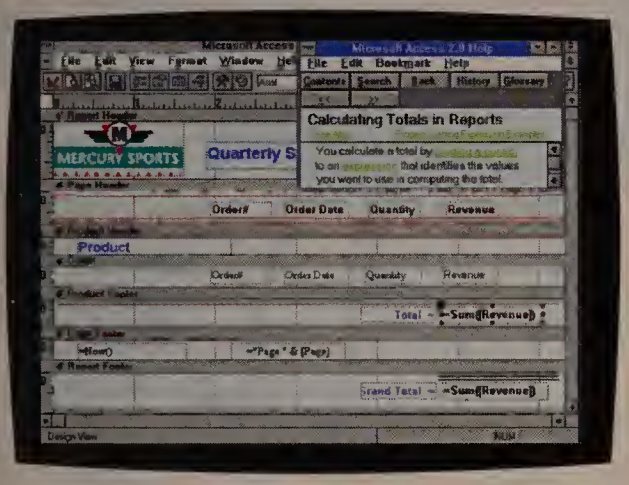
$495 suggested retail price. $129 special price expires Dec. 31, 1994. **$299 SmartSuite upgrade promotional price available while supplies last. In Canada call **1-800-GO-LOTUS**. ©1994 X10 and PowerKey are trademarks of Lotus Development Corporation. Access is a registered trademark and Windows is a trademark of Microsoft Corporation.

managing contacts and analyzing and reporting data are surprisingly simple.

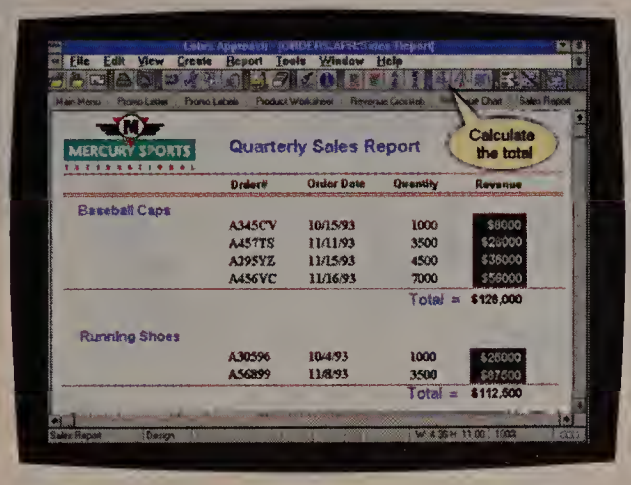
Over 200 new usability and power features will take even the most overworked skeptic to productive database-user-for-life in two hours.* Don't doubt it. There's a good reason why Approach is the fastest-growing database in the business.

Easy as 1-2-3.

Lotus Approach is the only database with PowerClick™ reporting, letting you see and alter reports as you build them. Just click on the intuitive SmartIcons® to organize and calculate data. And, the friendly on-line Assistants help to design reports, forms, mailings, analyses and more. Compared to Microsoft Access,® well there's no comparison. As *Infoworld* recently commented, "Approach (3.0) looks like a better choice than Microsoft Access (2.0): easier to use, yet still fast and powerful."††



Constructing a report in Access? "Easy"?



Constructing the same report in Approach. Easy.

And Approach 3.0 extends the power of Lotus 1-2-3 allowing you to create intelligent forms, PowerClick reports, mailing labels, and dynamic crosstabs on your worksheet without ever leaving 1-2-3.

Approach X10™ query technology delivers blazing speed in organizing, analyzing and manipulating databases. And, Approach provides the highest performance connectivity to virtually any database, from dBase® to Access, to Lotus Notes® and more. Plus Approach includes a powerful new macro capability for sophisticated application development.

And its advanced integration with Lotus Notes, the leading groupware application, makes it the obvious choice for people who work together in groups.

Only Lotus Approach 3.0 gives you:

PowerClick reportwriter (for WYSIWYG design)

InfoBox (instant on-screen manipulation)

Smart Assistants (to guide you)

PowerKey™ technology (for direct access to existing data)

Lotus 1-2-3 Integration (for working with 1-2-3)

Lotus Notes Integration (for reporting on Notes data)

X10 speed architecture (for blazing speed)

Dynamic crosstabs (for drag and drop analysis)

$129 Special Introductory Price.

Lotus Approach is one of five Windows™ applications that make up Lotus SmartSuite.® Look into it while a SmartSuite upgrade costs just $299.** Call **1-800-TRADE-UP, ext. 9948** for more information.

Lotus
Working Together®

Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus, Lotus Notes, 1-2-3, Approach, SmartSuite, SmartIcons and Working Together are registered trademarks and PowerClick, dBase is a registered trademark of Borland International Inc. *MarketProbe International, New York, NY, February, 1993. †*PC Computing*, July, 1994. ††*Infoworld*, April 4, 1994.

It's All in the Image

. . . including Layering and Dimensioning.

We didn't put a man on Mars, but we did come up with the perfect color monitor for CAD/CAM/CAE. Whether you're working with rendering, analysis, mechanicals or solid modeling, you need the right tools to turn your ideas into reality. That's why we developed the ViewSonic 21 – it displays your work the way you want it to look.

Featuring a 0.25mm dot pitch and resolutions up to 1,600 x 1,280, this 21" monitor provides you with a completely flicker free image. That's very important when you're working at your monitor all day. The double dynamic focus system of the powerful ViewSonic 21 produces sharp, clear images with picture-perfect colors. In addition to the vivid, luminescent image, our digitally-controlled monitor boasts of ViewMatch,™ a color control system that adjusts screen colors to closely match printer or plotter output.

In keeping with our commitment to protect the environment, our energy-efficient monitor **exceeds** the EPA's Energy Star requirements and powers down to under 5 watts in the "*Off*" mode. Plus, the monitor is certified to meet MPR-II standards for radiation and emissions.

Compatible with both PC and MAC systems, the ViewSonic 21 provides the productivity you need and the precise color images you demand.

It's all in the image. . . See The Difference!

ViewSonic®
See The Difference!™

20480 Business Parkway Walnut, CA 91789
Tel: (800) 888-8583 or (909) 869-7976 Fax: (909) 869-7958
or via AppleLink: VIEWSONIC or Compuserve: 73374, 514

21" CRTs yield a 19.7" diagonal viewable screen.
The EPA only promotes energy efficiency and does not endorse any particular company or product.
All products and brand names are registered trademarks of their respective companies.

Circle 224 on reader service card

Collision on the Information Superhighway

Remember the S&Ls

Joe Abernathy is the best political reporter in computer journalism today. That's a peculiar distinction but one *PC World* should be proud of. "Highway Robbery: Selling the Net" [May] is the sort of story about the information superhighway I wish I'd seen about the savings and loans before it was too late.

Remember that S&L deregulation was deemed too technical for people to understand or elected officials to take responsibility for. I'd like to think such a situation won't happen again, but it will unless people are well-informed. That is not the responsibility of *PC World* alone, but your efforts are, so far, singular. Good job!

John Robert Behrman, MCI Mail

A Palpable Hit

Joe Abernathy's timely and insightful piece about the Internet is a first-rate piece of investigative journalism. It should be required reading for all who will be affected by the flow of information in the future—that's nearly everyone. This kind of far-reaching news doesn't always appear in your pages, but you scored a major hit with this article.

I urge readers to voice their opinions about the direction that the information superhighway should take. They should contact their representatives in Washington, many of whom are not technically sophisticated and may be easily influenced by the massive lobbying effort on behalf of the telecommunications and entertainment giants.

Bill Pierce, Des Moines

Heritage Rebuts Report

Joe Abernathy undermines the credibility of his "investigative" report by parroting false allegations that he could have checked with a quick phone call.

According to one of Abernathy's sources—Jeffrey Chester, executive director of the Center for Media Education—industry not only is lobbying Congress but has, in effect, purchased the support of several probusiness think tanks. Abernathy quotes Chester as saying, "The Heritage Foundation, the Manhattan Institute, the American Enterprise Institute, the Cato Institute, all have telecommunications projects trying to influence public policy...they're all funded by the telecommunications industry."

For the record: The Heritage Foundation has no such project. We perform no contract work. Of the more than 2000 policy papers and articles we've published in the past five years, only 3 had anything to do with telecommunications policy. Another is scheduled for publication this year, but I'm told the author's recommendations are at odds with many of the demands made by industry. Of the 23 companies mentioned by name in that article—and the several regional Bells not mentioned by name—only one is a Heritage Foundation contributor, providing us last year with approximately ⅒ of 1 percent of our total income. We also received funding from a second company involved in telecommunications last year, an additional $15,000 out of $22.9 million in income.

If the rest of Abernathy's Nader-style diatribe is as accurate as the paragraph I take issue with, *PC World* owes its readers an apology.

Herb Berkowitz, vice president, The Heritage Foundation

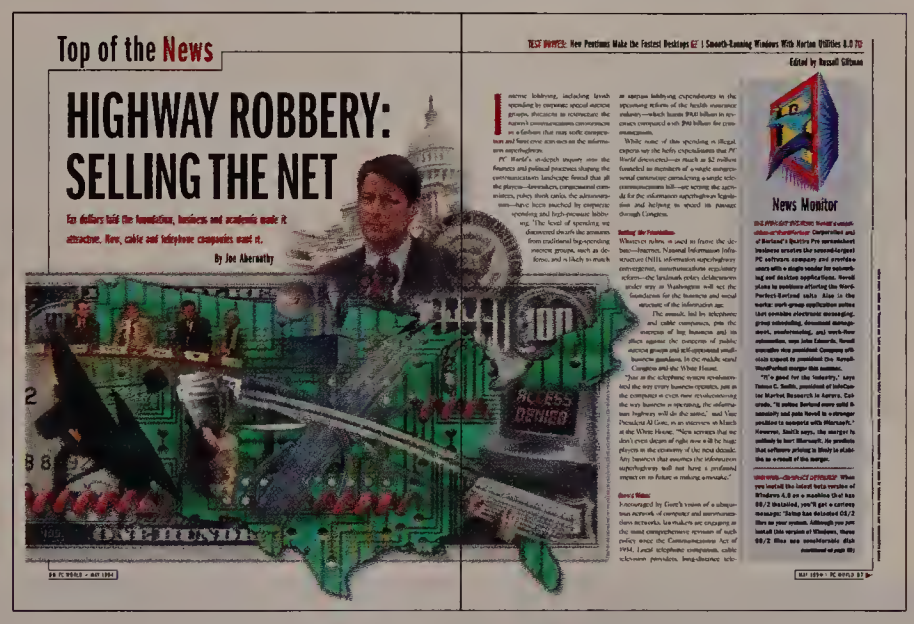
Cato Disputes Claim

In "Highway Robbery: Selling the Net," Joe Abernathy claims that the "writing and publication" of *Telecompetition: The Free Market Road to the Information Highway* by Lawrence Gasman was "funded by the telephone industry." That claim is false, and I'm amazed a reputable publication would print it without double-checking it.

I don't know how Abernathy came up with this notion. Perhaps he noticed that 1 of the 75 or so corporate and foundation sponsors of the Cato Institute listed in our annual report is the Ameritech Foundation. That's a slim reed on which to base the claim that a particular book was funded by the telephone industry. You might as well say it was funded by the American Farm Bureau Federation, the Coca-Cola Company, or the Golden Rule Insurance Company, all recent contributors also listed in the annual report.

The Cato Institute defends individual freedom, limited government, free markets, and civil liberties across a whole spectrum of issues. In the telecommunications field, that means letting the free market work and guaranteeing First Amendment protection for broadcasters and other communicators. If you find us taking money from a corporation and subsequently opposing free-market, voluntary solutions, then you'll have a story.

I not only support the capitalist system that makes innovation and technology possible, I admire the individuals


Top of the News

HIGHWAY ROBBERY: SELLING THE NET

By Joe Abernathy

News Monitor

PHOTO ILLUSTRATION: JEFF BERLIN; AL GORE: FINN HESTOFT/SABA; SUMMIT: FINN HESTOFT/SABA; ILLUSTRATION: LINDA BLECK

and companies who bring us new products and services. So if any company that provides goods and services to consumers wants to contribute to the Cato Institute's defense of free markets and civil liberties, we'll be happy to accept its support.
David D. Boaz, executive vice president, Cato Institute

Author's response: All the foundations criticized in Jeffrey Chester's quote were offered the opportunity to respond before the article was published. The Heritage Foundation did not respond, and the Cato Institute did not respond substantively on questions regarding the sources of funding.

Moreover, having only a few direct contributions from the telecommunications industry does not mean that these foundations do not get considerable amounts of money from the industry or from individuals with substantial interests in it. The Heritage Foundation may not have many direct corporate telecommunications backers, but its annual report indicates that major funders include the Scaise Family Foundation, the Bradley Foundation, and the Olin Foundation, all of which back media-related projects promoting laissez-faire government and antiregulatory policies. In addition, the foundation claims to have over 200,000 contributors, most of them individuals whose identity is concealed.

Similarly, only Ameritech can be identified as a direct corporate telecommunications backer of the Cato Institute. But the Cato Institute's annual report shows backing from the T. Rowe Price Associates Foundation. That Wall Street firm's New Media Fund, focusing on information superhighway development projects, lists "government regulation" as one of the risk factors of which investors should be aware.

Perhaps more important than corporate backers, however, are the hundreds of thousands of anonymous individuals who support these foundations. Because politicians are required to report individual contributions, I was able to identify how much each lawmaker accepted in contributions from known special interests. Rep. Ed Markey, for instance, doesn't accept "hard" donations from telecommunications interests, but he accepted $61,000 in "soft money" from individuals associated with the telecommunications industry. Only if the Cato Institute and the Heritage Foundation agree to disclose the names of individual supporters and the amount they've donated will the full range of influences on their policy positions be known. So far, they have declined to do so. —*Joe Abernathy*

If It Looks Like a Bug and It Acts Like a Bug...

In "Bug Blamefest [*Letters*, May], Paul J. Mulcahy states, "This dinosaur—with 32 years of programming, systems analysis, and consulting experience—believes that unsophisticated users often expect too much from a software package," and implies that users often perceive bugs that don't exist.

The real dinosaur in this case is the attitude that users should adapt themselves to the way the designers intended a program to behave. If an interface has elements that seem like bugs to a novice, then effectively they are bugs and should be reworked. In designing software, it is best to sacrifice originality for simplicity and directness.

SAVE THE WORKOUT FOR THE GYM

TRADITIONAL KEYBOARDING CAN BE A REAL WORKOUT. TWISTING WRISTS, ARCHING FINGERS, STRETCHING HANDS: THE USUAL GYMNASTICS. BUT WITH A KINESIS® KEYBOARD, KEYING'S NO SWEAT. YOUR KINESIS KEYBOARD WORKS WITH YOU, HOWEVER YOU WORK:

IN QWERTY, DVORAK OR A KEY LAYOUT YOU DESIGN. WITH ENERGY-SAVING MACROS. PALM RESTS. FOOT SWITCHES. FOR KEYBOARDING MINUS THE WORKOUT, CALL 800.454.6374. USE A KINESIS KEYBOARD FOR A MONTH. IF IT DOESN'T WORK OUT, WE'LL REFUND YOUR MONEY.

PC® MACINTOSH® AND SUN® COMPATIBLE

KINESIS® CORPORATION

915 118TH AVENUE SE | BELLEVUE WA 98005 | 800.454.6374 | FAX 206.455.9233

Circle 118 on reader service card

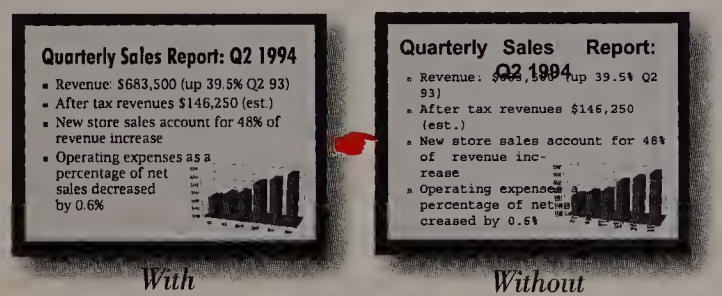
Take The Hocus-Pocus Out Of Sharing Documents In Your Workgroup

[Make missing font problems disappear, no tricks, no fooling]

Somebody in your workgroup sends their beautiful presentation across the network for comments and all of a sudden, presto-chango— spaced-out headings, broken bullet points, crooked columns, and a printer that needs a miracle just to print it all out.

Protect your workgroup from those document disasters with Font Works for Windows. The network utility set that works like magic to wipe out font and formatting problems, forever.

Font Works is an amazing collection of fonts and font utilities built neatly into a compact Windows application. On all the computers in your workgroup, it's guaranteed to eliminate formatting problems whether documents are received over the network, via modem, or on floppies. Instead of buying new applications to share documents, it lets you share files created with the programs you already own. And once installed, Font Works handles everything all by itself. You literally never have to touch it. It's really that easy.



With *Without*

With Font Works you'll never worry about broken presentations or documents again.

So, how does it work? When fonts are missing in a document, Font Work's PANOSE technology automatically creates screen and printer versions to match the fonts in question. Without messy viewers or bloated file sizes, documents print quickly and smoothly. Looking just the way they're supposed to.

Call now and get our Workgroup Evaluation Kit that allows 10 networked users to try Font Works for 60 days for only $79.* After you try it, we think you'll buy Font Works for the same reason you've standardized on Application Suites: Font Works is a great deal, it increases productivity, and it reduces support costs. No abra-cadabra. No hocus-pocus.

FONT WORKS

10-User 60-Day Workgroup Evaluation Pack & Network White Paper. Only $79!
1-206-448-9600 Ex.8058

yes It runs with NetWare®

*Try Font Works for 60-days and if you like it, get a $200 rebate on the 10-user license (regular price, $600, you pay $400) Or, do nothing and keep a single user license for your $79. © 1994 ElseWare Corporation. 206/448-9600. FAX: 206-448-7220 Font Works is a trademark, and PANOSE is a registered trademark of the ElseWare Corporation.

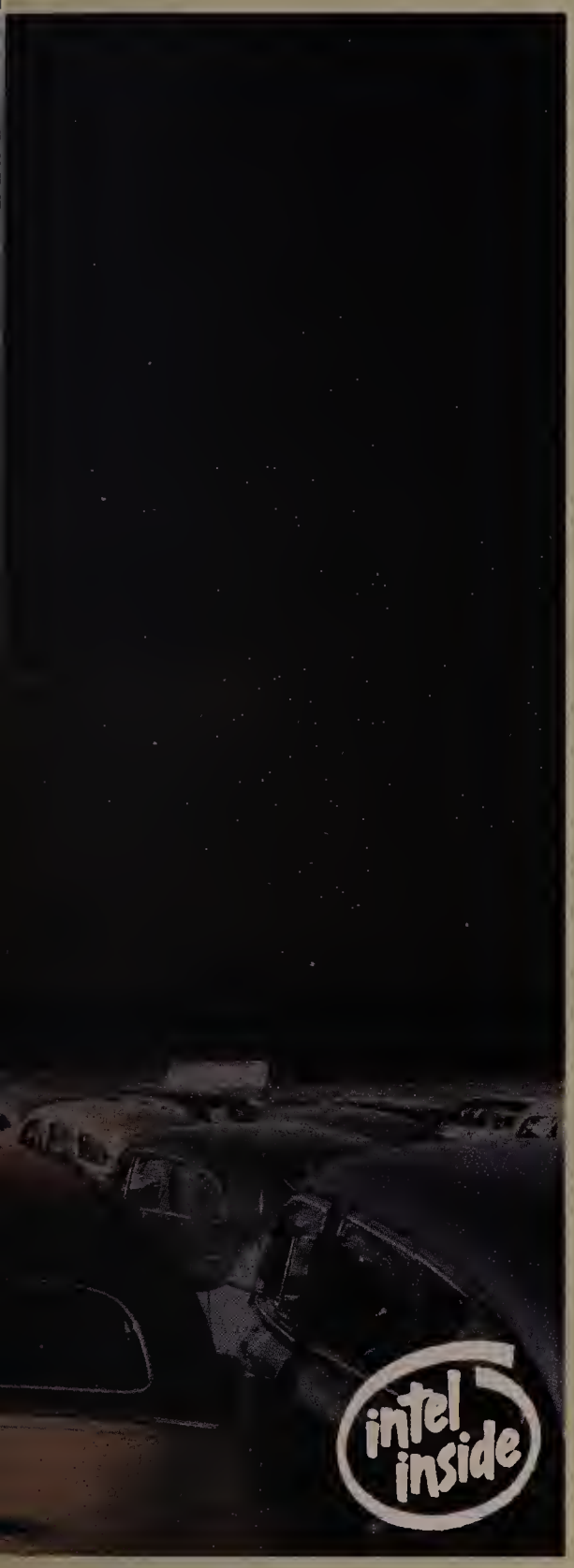
Circle 101 on reader service card

INTRODUCING THE ASCENTIA™ 900N PERFORMANCE NOTEBOOK. Not since the days you bumped up to the front row in an old Chevy and looked up at a screen the size of a building has something looked so striking. This is one monster screen, with ten and a half inches of TFT active-matrix or dual-scan STN color. It's the biggest screen available today.

Your work will dazzle with vibrant colors, and your audience will appreciate the kind of high definition that makes the most complex graphics, even the fine print, quite readable.

Still, there's plenty more to the

©1994 AST Research, Inc. All rights reserved. AST is a registered trademark of AST Research, Inc. AST Computer, the AST logo, Ascentia and "You'll Like the Way We Work" are trademarks of AST Research, Inc. The Intel Inside logo is service in over 30 countries outside the U.S. is on a carry-in basis to the nearest AST-authorized service provider. **In the U.S. only. †CY93 unit volume shipments of AST and AST manufactured brands (International Data Corp.).



	AST 900N	IBM 755C,Cs	COMPAQ LTE ELITE	TOSHIBA T4800CT
Screen	*10.4" TFT 10.3" DS-STN*	*10.4" TFT 9.5" DS-STN*	*9.5" TFT*	*9.5" TFT*
Battery Life	*4-8hrs*	*3.1-8hrs*	*2.5-4hrs*	*2.5-4hrs*
Pointing Device	*Integrated Trackstick*	*Integrated Trackpoint*	*Integrated Trackball*	*External Trackball*

Intel DX4/75MHz comparable products as of 6/13/94. Screen measured diagonally. Battery life from manufacturers' specifications.

900N than just an eye-popping screen. This is very much a high performance notebook, with a powerful Intel 486 processor, up to 75MHz. Local bus architecture combined with hardware accelerated graphics deliver as much as 16 million WinMarks.

Inside, AST's intelligent power management system actually adjusts the computer to your work habits, taking a breather when you do. So the battery life lasts from four to eight hours or about the length of a Godzilla film festival. That's longer than a similar Compaq or Toshiba laptop.

In fact, everything you need to be truly mobile is right here. For instance, the pointing stick is right at your fingertips. There are two PCMCIA slots. Or, if you prefer, you can add a docking station for more expansion.

Of course, there is a three-year worldwide limited warranty,* with a year of 48-hour rapid repair service.** And our telephone support group is here to help you every day, 24 hours a day. It's the kind of responsiveness you'd expect from the fifth largest manufacturer of personal computers.†

You've got to see the new Ascentia 900N notebook from AST. For a screening or more information, please call 800-876-4AST.

Intel DX4/75MHz or DX2/50MHz.

10.4" or 9.5" diag. TFT, or 10.3" diag. DS-STN color display.

340MB or 510MB removable hard drive.

4MB or 8MB RAM, upgradable to 32MB.

VL bus hardware graphics accelerator.

Two PCMCIA slots, two type II or one type III.

"Hot swappable" NiMH battery with 60-minute FastCharge.

Under 7.0 lbs.

SmartPoint track stick.

Pre-loaded with Windows and a package of mobile communications software.

YOU'LL LIKE THE WAY WE WORK™

AST COMPUTER

*a registered trademark of Intel Corporation. All other product or service names mentioned herein may be trademarks or registered trademarks of their respective owners. *Warranty*

If developers—even the big names—foist buggy and confusing software on us, let's seek out new software.
Russell Belfer, MCI Mail

Double Crush on the Nerves

Regarding your news item "Keeping Up" [*Consumer Watch*, May]: Medical research since 1973 has indicated that carpal tunnel syndrome often results from a "double crush" on the nerves leading to the hand. The nerves are pinched and injured where they exit the spinal column and again at the wrist in the carpal tunnel.

Research shows that if the pinching of nerves at the spinal column is not relieved, carpal tunnel won't be relieved by surgery or any other method. This is not chiropractic baloney; it's hard-and-fast medical research published in neurology journals.

The tendency of medical doctors to ignore this research is typical of their medicine-and-surgery mindset. Not all chiropractors do such a hot job either; however, if any of your readers suffer from carpal tunnel syndrome, they should get their neck treated as well as their wrist.
Jesse Jutkowitz, chiropractor
Washington, D.C.

Tip Touch-Up

In reference to tip 14 in "50 Word Processing Tips" [May]: In WordPerfect 5.1 and 6.0 for DOS, you can save a keystroke when starting the block function by pressing **<F12>** instead of <Alt>-<F4>. To block to the end of the current line, just press **<End>**. WordPerfect 6.0 for DOS does not require the <Home><End> key sequence noted in your article.
Gerald W. Litynski, Crestview, Florida

Corrections and Clarifications

In April *New Products*, we reported that Hewlett-Packard's DeskJet 560C can print 600 by 300 dots per inch. We should have pointed out that it does so only in black and white. And although HP told us the 560C has an optional PostScript upgrade module, this option exists only for the DeskWriter 560C (for Macs).

In tip 13 of May's "50 Word Processing Tips," the <F1>R keystroke doesn't work to paste a block in WordPerfect 6.0. In that version, use **<Esc>R** instead.

Due to an editing error, June's "Big Hard Drives: 300MB and Counting" misstated the number of drives that are supported by the Enhanced IDE standard. Under the new standard, the IDE interface supports four IDE devices if the system uses a dual channel IDE setup. (It will support more using multiple IDE connectors, but the dual channel setup is likely to be the most common.)

In July's "Best Products of 1994," we listed incorrect version numbers for two software packages. We should have listed Lotus Notes 3.0 as the winner of the Groupware category and Intuit's QuickBooks 2.0 for Windows as the winner of the Accounting category. We also gave the wrong phone number for Calera Recognition Systems. The correct number is 800/422-5372.

PC World regrets the errors.

Letters *welcomes your responses and ideas (see page 10 for contact information).*

With Backpack's unique printer port connection, family support has never been easier.

Adding additional storage to your IBM compatible, laptop or notebook has never been easier. The *backpack*® family of no-slot drives plugs directly into your parallel printer port to provide you with additional storage instantly. Using them one at a time, or daisy chaining up to four together, there are no interface cards to install so you don't have to open the cabinet of your computer. And because your printer attaches directly to the *backpack* drive, you don't have to disrupt your print operations. With the *backpack* family of diskette, hard, tape or CD-ROM drives, you can easily transport your information wherever you go—just plug *backpack* into the parallel printer port of any IBM compatible or portable. And, of course, all *backpack* drives work with Windows.™ With *backpack*, there's no hassle. Just sit back and enjoy the new member of the family.

Just plug and play. It's the no-hassle approach to additional storage.

MicroSolutions

132 W. Lincoln Hwy. DeKalb, Illinois 60115 Telephone 815.756.3411 FAX 815.756.2928
Call Toll Free 800.294.1214

Circle 200 on reader service card

Serious Savings on Toys!

A Quantex Multimedia Package Priced to Make You Smile

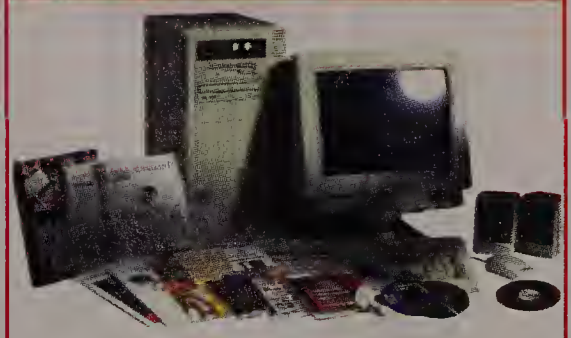
The cost of computer toys can really add up. That's why, at Quantex, we're committed to giving you the most features at the best prices. Multimedia is no exception. Quantex has put together two multimedia packages that will meet your needs and excite your senses. And these toys are no kid's stuff. Take a look at what we've got for you.

Blast off to **MPC Level 2** standards with our double-spin **CD-ROM** drive and **Sound Blaster™** compatible 16-bit stereo sound card with stereo speakers. Run wild with one of these CD-ROM bundles: the first system includes **Compton's Interactive Encyclopedia™, Microsoft® Dinosaurs,** and **Microsoft Works**, while the other features **Compton's Interactive Encyclopedia, Dictionary of the Living World, Compton's Family Choice, Mayo Clinic Family Health Book,** and the **Kodak® Photo CD**!

Plus, go for the gold with **Microsoft Money** and **Microsoft Entertainment Pack**. Zip along the communication highway with our built-in high-speed fax/modems. Access over 17,000 databases with **CompuServe®**, **Prodigy®**, and **America On-Line**. And the **Pentium™ OverDrive™ Ready** ZIF socket makes future processor upgradeability a cinch.

Take advantage of this multi-faceted multimedia package from Quantex. Give us a call now. You'll discover we may sell toys, but we don't fool around.

Multimedia Systems



Q486SX/33VM-1 **$1349**

- Intel486™ SX33 Processor
- 4MB RAM
- 340MB 12ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- VESA Bus Graphics Accelerator w/ 1MB
- 14" 1024x768 NI Color Monitor
- 5-Bay desktop case
- 101-Key enhanced keyboard & Mouse
- 9600/2400 Baud Fax/Modem w/software
- Double-spin multisession CD-ROM drive
- 16-Bit Stereo Sound Card w/speakers
- MS-DOS & WFW 3.11
- 3 CD Discs: Compton's Interactive Encyclopedia, MS-Dinosaurs & MS-Works
- MS-Money & MS-Entertainment Pack
- Prodigy, Compuserve, and America On-Line

Q486DX2/50VM-1	**$1499**
Q486DX2/66VM-1	**$1549**
Q486DX4/100VM-1	**$1899**

QP5/60PM-1 **$2199**

- Intel Pentium™ Processor
- 8MB RAM, 256KB Fast Cache
- 540MB 12ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- 64-bit PCI Bus Graphics Engine w/ 1MB
- PCI Local Bus Enhanced IDE controller
- 15" Digital Color NI Monitor
- 11-Bay Mid-Tower case
- 101-Key enhanced keyboard & Mouse
- 14,400 Baud Fax/Modem w/software
- Double-spin multisession CD-ROM drive
- 16-Bit Stereo Sound Card w/speakers
- MS-DOS & WFW 3.11
- 5 CD Discs: Compton's Interactive Encyclopedia, Compton's Family Choice, Dictonary of the Living World, Mayo Clinic Family Health Book, and Kodak Photo CD
- MS-Money & MS-Entertainment Pack
- Prodigy, Compuserve, and America On-Line

PCI SYSTEM

Q486DX2/66PM-1	**$1999**
QP5/66PM-1	**$2349**
QP5/90PM-1	**$2549**

Accept only the finest ... Caviar
WESTERN DIGITAL

intel inside

VISA MasterCard DISCOVER

Quantex accepts prepaid checks, Visa, MasterCard, Discover and American Express. Purchase orders from government agencies, universities, and Fortune 1000 companies also accepted. On-Site Service may not be available in certain remote areas. All returned items must have a Return Merchandise Authorization (RMA) number and must be in original packaging. Cost for returned freight is not included with any Money-Back Guarantees; shipping charges are non-refundable. Prices and product offerings subject to change without notice. Quantex Microsystems cannot be responsible for errors in typography or photography The Intel inside, Intel486, Intel Inside & Design and Pentium are trademarks of Intel Corporation.. Some of the names or trademarks shown herein may be the property of other companies. Prices calculated. Baby picture from Tony Stone Images.

QUANTEX Microsystems, Inc.

1-800-896-4898

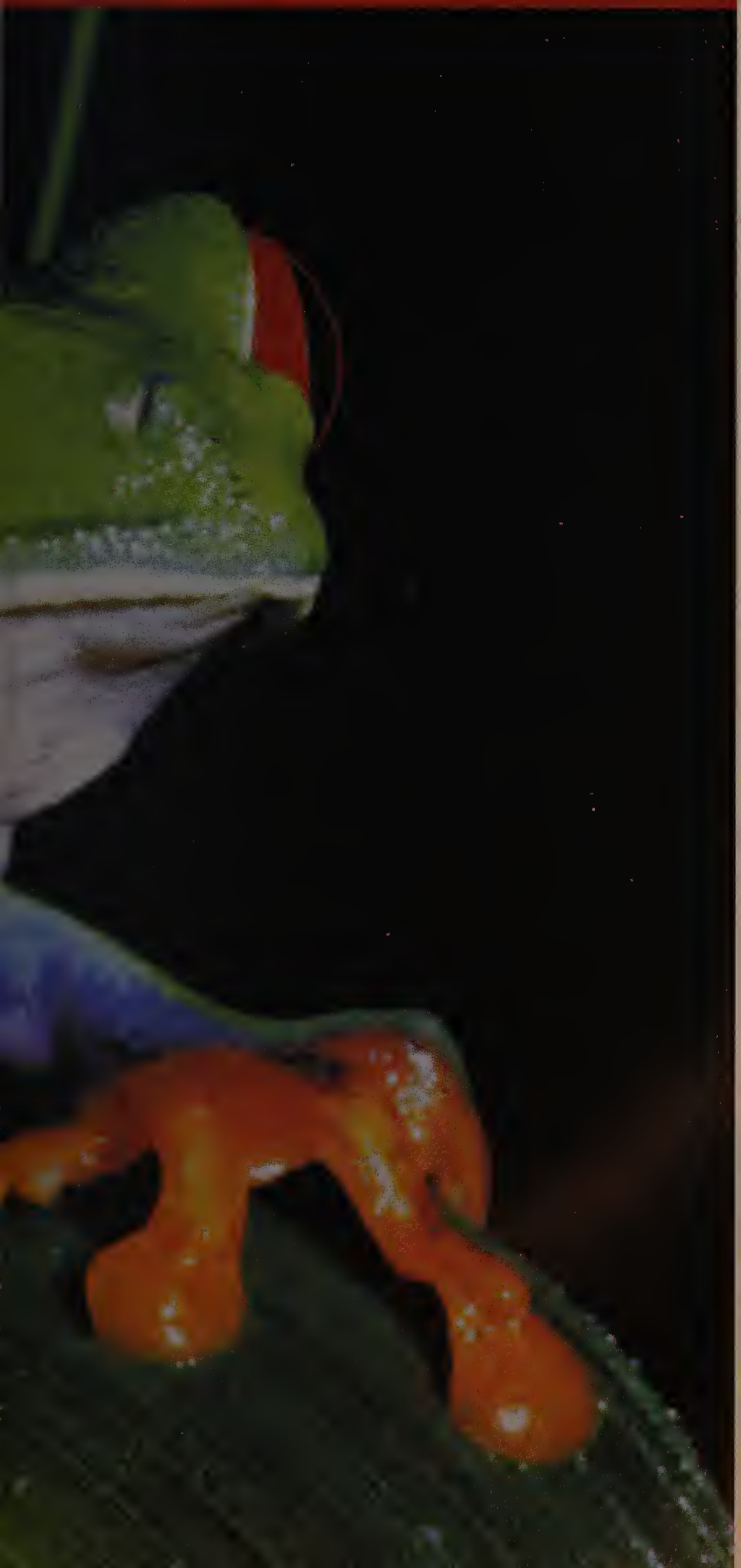
Circle 211 on reader service card

The detail of EPSON's 2400 dpi,
scanner really stands

Actual 30-bit scan

© 1994 EPSON AMERICA, INC., 20770 Madrona Ave., Torrance, CA 90503. For dealer referral or warranty details, call 800-BUY-EPSON. In Canada, call 800-GO-EPSON. For Latin America, 305-265-0092. EPSON, Adobe Photoshop, Kai's Power Tools and Macintosh are trademarks or registered trademarks of SEIKO EPSON CORP., Adobe Systems Inc., HSC Software and Apple Computer, Inc., respectively.

30-bit color
out.



When it comes to detail, the new EPSON ES-1200C is in a class by itself. It's the only personal scanner with both 2400 dpi and 30-bit color internal scanning for crisp, clear image reproduction.

To ensure the best results with any image you scan, the ES-1200C provides one and three pass scanning, and standard parallel and SCSI ports allow you to connect simultaneously with two PC's. All this means the ES-1200C gives you more power than anything else in its price range.

**The ES-1200C Pro for PC.
The highest detail
of any personal scanner.**

The ES-1200C Pro includes top-ranked Adobe Photoshop, Kai's Power Tools, and EPSONScan II and TWAIN driver, cable and interface. There's also a Mac version.

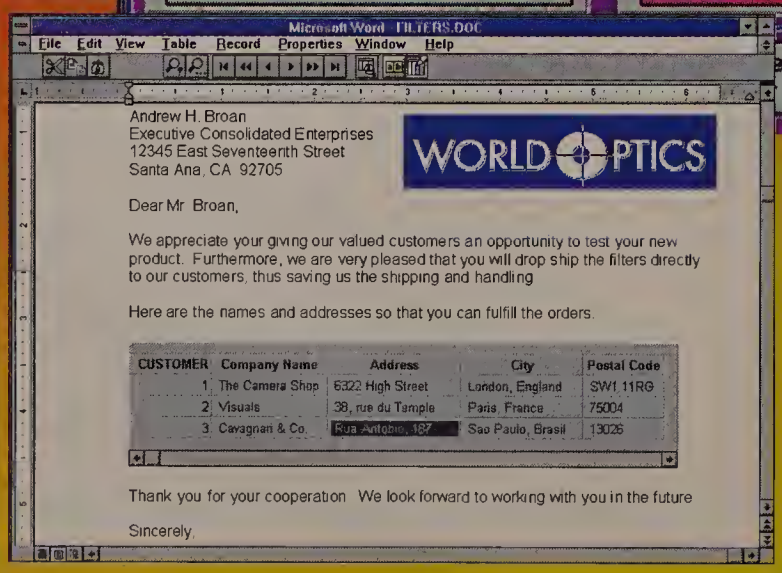
Feature	EPSON ES-1200C Pro	HP ScanJet IICX	Microtek II HR	Umax UC1260
Optical Resolution	600	400	600	600
Max Resolution	2400	1600	2400	2400
Bits Per Pixel	10	8	8	8
One & Three Pass	yes	no	no	no
Dual Connectivity	yes	no	no	no

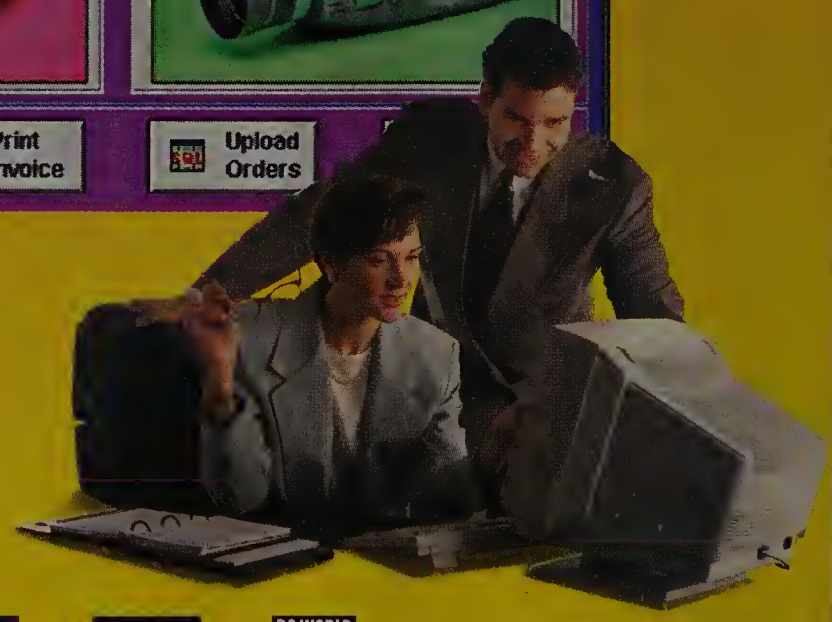
To see what a difference the details can make, visit your local authorized dealer or call 1-800-BUY-EPSON.

EPSON

Fast start . . . No limits!

Parad





▲ *Paradox for Windows has superior integration with Perfect Office and Microsoft Office applications. Thanks to OLE 2.0, you can place a "live" Paradox table into a Microsoft Word or WordPerfect document and edit the data in place. (Access 2.0 cannot do that.)*

February 1994 — November 1993 — June 1994

◀ *Paradox for Windows is the most award-winning Windows database on the market with over 20 major industry awards for excellence.*

Copyright © 1994 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. Offer good in U.S. and Canada only. All prices in U.S. dollars. Dealer prices may vary. BI 7402

OX

NEW VERSION 5.0

Paradox
WORLD TOUR
Coming to a city near you!
For more information dial Fast Fax
1-800-408-0001

New version is easier than ever

The new Paradox® 5.0 for Windows is here, and suddenly managing your business data and building database applications just got faster and easier. You'll be amazed at what you can do with the new tools that let you start fast and do more. For example, 13 new Interactive Coaches quickly teach you how to accomplish any task. The Coaches even let you work with your own "live" data, so you complete your work as you learn. Then there are the on-line Experts™ that guide you step-by-step in creating professional-looking forms, reports, and mailing labels. Even your largest data management tasks will be completed in record time.

Office integration outshines Access

Full client and server support for OLE 2.0 and DDE make Paradox the best database for use with other applications including Perfect Office and Microsoft Office. For example, you can place a "live" Paradox table in a Word document, edit the table in place, and your changes are automatically updated *(Access can't do this)*. And Paradox gives you record level locking, that provides enhanced productivity in multiuser environments. *(Access locks up your whole page!)*

Want to increase your workgroup productivity? Paradox's built-in Workgroup Desktop and new Mail Enablement make it easy to publish and subscribe the latest data, using your existing network or e-mail system. This makes it simple to get weekly or monthly updates like sales and expense information.

Comparison Facts

End-user Features	Paradox 5.0	Access 2.0
Built-in computer-based training	✓	
Experts/Wizards to guide you step-by-step	✓	✓
Integrated graphics	✓	
Built-in workgroup and mail capabilities	✓	
Quick Filters without query process	✓	
Power-user/Developer Features		
DLE 2.0 client and server support	✓	
Compatibility with applications from previous version	✓	
Visual Data Model Designer	✓	
Transparent connectivity and scalability with database aliases	✓	
Record level locking	✓	
Full range of data types, including Time, Graphic and Autoincrement	✓	
Graphical Integrated Development Environment (IDE)	✓	
ODBC-compliant	✓	✓
Dedicated high-performance native SQL drivers	✓	

More speed, developer enhancements, and Client/Server connectivity

New Paradox 5.0 for Windows has been tuned to give you better performance. It stores and retrieves data faster, and delivers answers to queries with more speed than ever before.

And Paradox 5.0 for Windows has kept developers in mind too. There's a new Integrated Development Environment and more than 300 new Methods and Properties help you develop ObjectPAL™ Windows applications faster. Plus, with Borland's new high-performance native SQL links, Paradox is ready when you are to upsize your applications to the Client/Server environment.

Get started fast with Paradox 5.0 for Windows' ease of use and you'll quickly discover it's the one database with the depth and performance you want to stay with.

Special competitive upgrade offer!

$199.95 90-day money-back guarantee

See your dealer, or call today!

1-800-336-6464, ext. 9050

In Canada call 1-800-461-3327

Borland
The Upsizing Company

Circle 63 on reader service card

Unequal Distribution: The Information Haves and Have-Nots

In the barrage of news stories about the information superhighway, you may find at least a passing mention of the thorny issue of access to technology—who has it and, just as important, who doesn't. A new report from the Times Mirror Center for the People and the Press, "Technology in the American Household," sheds some light on this subject and points out an alarming disparity between PC-equipped households and those that have yet to become part of the PC revolution.

According to this study, released in May, the higher your income level, the more likely you'll have access to the latest and greatest high-tech equipment. That doesn't come as a huge surprise. After all, the more disposable income you have, the greater the chance you'll spend some of it on electronic gadgetry of all types. But the disparity is more apparent with PCs than it is with just about any other equipment, says Andrew Kohut, director of the Times Mirror Center. And the difference appears even more pronounced when you factor in the education level of the respondents, he adds.

Consider these statistics: Households in which the adults earn $50,000 or more a year and at least one adult has a college education are *five times* more likely to own a PC and *ten times* more likely to go online. That news is disturbing enough, given the critical role PCs play in the distribution of and access to information; but the study goes on to consider what effect the unequal distribution of technology has on kids. Among college graduates with children, 49 percent of households surveyed had a PC; that compares with just 17 percent of homes in which the parents had only a high school diploma.

Kids who don't have access to PCs at home can't compete on an equal basis with classmates who do, notes Kohut. They may not do as well in school, go on to four-year colleges, or earn significantly more than their parents. "If the road to equality is access to information technology, then there are some real roadblocks in place," says Kohut. He believes that the playing field can be leveled by providing children more equal access to computers—either through schools or through local community groups. And he's not alone in holding that belief.

Righting the Scales

Currently, a small but growing number of groups is working to bring individuals from lower socioeconomic backgrounds into the computing world. Right now, these groups operate largely independently of one another, each one focusing on a small community where the reach may be minimal but the effects can be enormous.

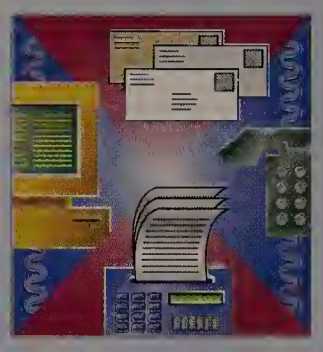
One such project is in eastern Long Island, New York, where three groups have come together to form the Learning and Information Network for Community Telecomputing (LINCT). For the past nine months, the coalition has been working to develop a community bulletin board system (BBS) as well as a computer access program. Organized through the local community center, the program's goal is to help residents achieve universal—and equitable—access to computers, at the lowest possible cost, says Ken Komoski, executive director of the Educational Products Information Exchange Institute and one of LINCT's founders. LINCT solicits donations from corporations that are upgrading their computers, and it passes along the still-usable hand-me-downs to low-income residents. To participate, families need only sign up for computer classes through the community center; they earn the computer as they take classes on how to use it.

It's a great program—the kind of arrangement that not only puts computers in the hands of disenfranchised groups but also makes sure that they know how to use their new machines. LINCT is working to establish similar programs in two other areas of the country—Indian River County, Florida, and the Englewood district of Chicago.

By Roberta Furger

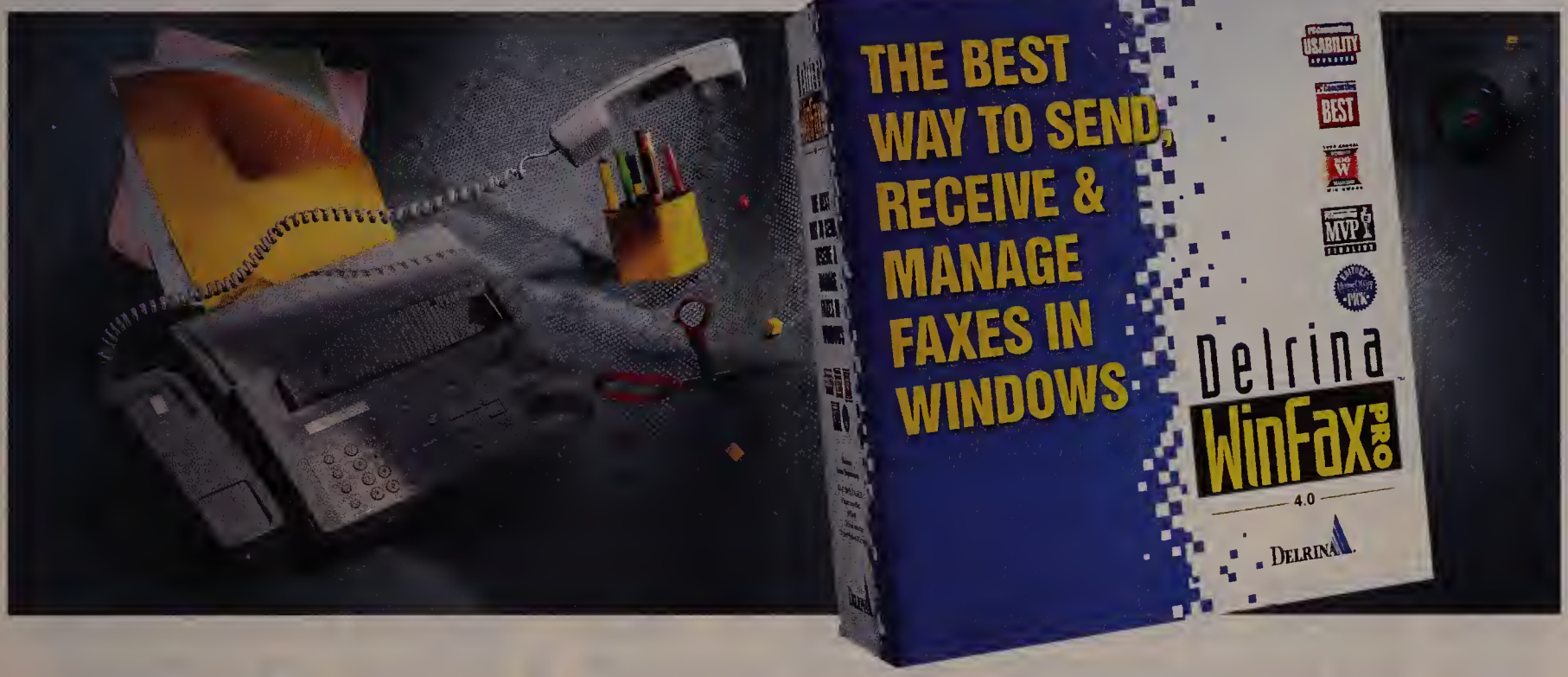
ROBERT HOLMGREN

KEEPING UP



Running out of memory? A new marketing gimmick from Z-RAM (a division of Camintonn Corporation) should make upgrading your computer's memory a lot easier. PC-equipped kiosks that are set up at computer retailers display a software program that takes some of the confusion out of upgrading RAM. Type the name and model number of your PC, notebook, or laser printer, and up pops a diagram showing the number of slots available for upgrading—and the part number and price. The downside: You're limited to the computers and printers for which Z-RAM sells memory, and the display is currently available only at Computer City stores—though Z-RAM says more will follow... Corel Software joins the crowd of software companies charging for technical support. Instead of getting free support on a toll line, Corel customers will now pay a fee and use a toll-free number for the call. When you register CorelDraw, Corel Gallery, or CorelFlow, you receive credit for one 15-minute tech support call on a toll-free line. After that, you can purchase additional credits, or call 900/896-8880 (United States customers only) and pay $2 per minute.

Introducing Delrina WinFax PRO™ 4.0. You'll wonder how you ever faxed without it.



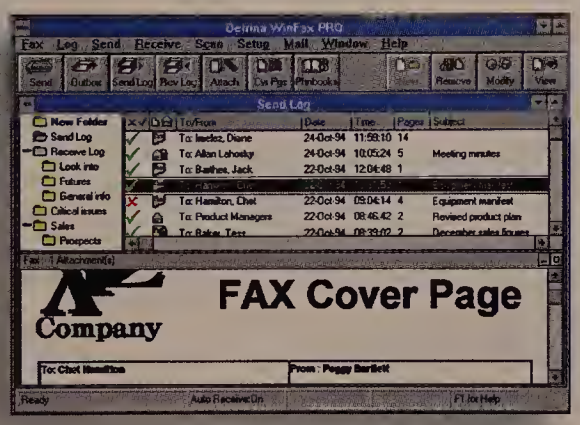
Meet the fastest, easiest, most convenient way ever to handle all your faxing – new Delrina WinFax PRO™ 4.0, the latest version of the best-selling fax software in the world. The only one that combines the advanced faxing features you need with astonishing new ease and usability.

"The best fax package there is."

That's what *PC/Computing* said about version 3.0. And now we've made it even better.

Starting with the revolutionary new streamlined interface that makes it simpler than ever to do anything you'd do with a fax machine, and a lot more. Like sending faxes directly from within any Windows application as easily as you'd print. Or organizing sent and received faxes in convenient folders. Or converting faxes into word processing documents with OCR.

There's added convenience with dozens of ready-to-use cover pages. Fax phonebooks that are drag-and-drop simple. And improved fax annotation tools that even let you add your signature.



Based on extensive usability testing, the new customizable interface includes folders for organizing sent and received faxes.

Don't try this with a fax machine.

Imagine faxing, not just an image of a document, but the actual file itself*, so it's ready to be used in an application. Imagine sending a single document that is automatically faxed to some people and e-mailed to others.

Now imagine you're on the road, and WinFax PRO automatically forwards faxes to you. Or lets you retrieve faxes sent to your regular fax number*. And there's more.

Get new Delrina WinFax PRO 4.0 today and put faxing where it really belongs – on your PC. Call now for information or to upgrade from WinFax PRO or WinFax LITE™. Or see your local dealer to upgrade immediately.

DELRINA®
1-800-268-6082

WinFax, WinFax PRO, WinFax LITE and Delrina are trademarks of Delrina (Canada) Corporation. All other product names are trademarks of their respective owners. © 1994 Delrina (Canada) Corporation. All rights reserved.
*Requires Class 1 modem.

Circle 99 on reader service card

IN THE WILD, THEY'RE KILLERS. IN BUSINESS, THEY'RE LIFESAVERS.

QMS 860 Hammerhead Print System 600x600 dpi • 11" x 17"/A3 • SRP $4595

QMS 860 Plus Print System 1200x600 dpi • 11" x 17"/A3 full edge-to-edge • SRP $5999

Dominant. Powerful. Precise. That's the formidable character of the QMS® 860 Hammerhead™ Print System. It's fast, compact and capable of remarkably accurate printing without hesitation.

And now the world's most popular 11 x 17/A3 laser printer is available with all of the features of the QMS 860, plus 1200x600 dpi resolution output...the powerful 24 MB QMS 860 Plus!

These desktop printers are creatures like no others - able to operate in mixed environments of PC, Macintosh® and workstation systems with standard and optional interfaces. Yet, with all their impressive power, they are both surprisingly affordable.

Others see them as killers. You'll see them as lifesavers. The QMS 860 and 860 Plus Print Systems. The perfect printing machines.

HAMMERHEAD
THE PERFECT PRINTING MACHINE

FEATURES	BENEFITS
• QMS 860 – 600x600 dpi output • QMS 860 Plus – 1200x600 dpi output	High resolution for camera-ready originals or accurate prepress proofs
• QMS 860 – Up to 11x17/A3 output • QMS 860 Plus – Up to 11x17/full bleed output (11x17 full edge-to-edge)	More flexible page layout, B-size check plots and no need for tiling
• QMS Crown™ technology, featuring multitasking, advanced job spooling, compile-ahead processing, context switching and virtual memory	Increases print job responsiveness, provides a platform for convenient, cost-effective enhancements and enables peak performance as a network node with interfaces supporting protocols that include EtherTalk,™ NetWare® and TCP/IP
• Compatible with a variety of languages including PostScript™ Level 2 and Level 1, HP PCL® and HP-GL®	Accommodates the latest application software on all major platforms
• SIO (Simultaneous Interface Option)	Accepts data streams on all ports simultaneously to increase system responsiveness for all users
• ESP (Emulation Sensing Processor)	Eliminates user intervention to select compatible printer language
• 39 resident type fonts, all with multilingual character sets	Flexibility and creativity for document production
• An international network of service and support organizations in over 230 metropolitan areas throughout the U.S. and around the world	Fast, local response to service and support requirements
• Several convenient service plans that include on-site response within an average of 4 hours, emergency service and other options	Flexible programs designed to be just right for your needs
• Our exclusive Q-Fax (800-633-3850 or 205-633-3850) and CompuServe® (GO DTPVEN) services at your fingertips 24 hours a day	Quick and easy access to a full range of information and support
• Full one-year warranty	Parts and labor coverage for the important components of your print system
• Emergency telephone support	Direct dialog with technical experts
• On-site installation available	Experts to assure fast, trouble-free installation

To get your business "Lifesaver" now or for the dealer nearest you, call **800 972-6695** Dept. **4015.**

QMS®

For service on QMS and other products, call 800 762-8894 (U.S.)
Q-Fax 800 633-7213 • E-mail: info@qms.com • Canada 800 263-5508

PC MAGAZINE EDITORS' CHOICE™
November 23, 1993
QMS 860 Print System

QMS, the QMS logo and Hammerhead are trademarks or registered trademarks of QMS, Inc. One Magnum Pass, Mobile, AL 36618, 205 633-4300. PostScript is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other product and company names are trademarks or registered trademarks of their respective companies.

LINCT equips its PCs with a variety of software, plus a modem and software for logging on to the area's community BBS. Based on the Cleveland Free-Net model (see *Consumer Watch*, September 1992), the BBS includes E-mail and a wide range of information about community and government services. There's even an area where residents can barter goods and services.

The only downside to these programs is that the donated computers are rarely state-of-the-art. So although more people have access to PCs, there's still considerable disparity between the donated equipment and the newer, more powerful machines used in more affluent homes. But it's a start toward a goal worth pursuing on a wider scale. After all, riding a bike—even an old one-speed—is a whole lot better than walking.

Shop Talk

We Tore Up Your Check

In April's *Consumer Watch* ("If It Sounds Too Good to Be True..."), Computer Associates said that customers who requested the "early bird" version of CA-Simply Tax (free, except for a shipping and handling charge of $9.95) would not be charged an additional $3.95 for the final "free" edition—and that people who had already paid the $3.95 fee would be reimbursed.

In January I sent the company a check for $3.95, along with the order card that came with my early bird edition. I never received the refund for $3.95 or the final edition of the software. I finally gave up and prepared my tax return manually.

George W. Snavely, Jr., Franklin, Tennessee

Editor's note: We contacted Computer Associates to see what happened to Snavely's refund—and his software package. A spokesperson for the company told us that it never cashed any of the $3.95 checks received for the upgrade and that it credited anyone who paid with a credit card. Computer Associates enclosed a note with the final edition of CA-Simply Tax explaining that the checks had been torn up, but because Snavely's order was lost or misdirected, he never got that letter. The representative apologized for the inconvenience.

Secondhand Warranty

Recently, my hard drive began to develop bad sectors, so I contacted the local company that made my computer. The customer service representative told me that even though the hard drive was less than a year old, the warranty was void because I had purchased the PC secondhand. Not dissuaded, I called Seagate—the manufacturer of the hard drive. A company representative told me that the hard drive was still under warranty and that I should ship it back to Seagate; the company even paid the return shipping costs.

It's a pleasure to find a company that stands behind its products and is helpful when something goes wrong. I do wonder, though, what the local computer company would have done with my old hard drive—shipped it back for repair and resale?

Larry Mormino, Cary, North Carolina

Editor's note: Most hard drive manufacturers warrant their drives to the reseller—not to the customers who finally purchase them. But most manufacturers will stand behind their products if you can't resolve the problem through the reseller, as was the case for Mormino. You may have more trouble than he did, but be persistent.

Back in the Fold

On October 25, 1993, I wrote to *Consumer Watch* concerning very poor customer service from PC Connection in Marlow, New Hampshire. Within a few weeks of sending that letter, I received a call from someone at PC Connection who told me he knew nothing of the problem until he was contacted by *PC World*. He agreed that the situation had been mishandled and offered to make amends.

When I told the representative that I had already purchased the software from another company, he gave me his direct phone number and told me to call him if I required something in the future and

POWER TIP no. 309

Quick Desktop Cleanup

To delete a Windows program group, first close the group's window, then delete the icon. That way, you don't have to delete the group's program icons one at a time.

Robert Luhn
Contributing Editor

Until now, this is how many fax machines you'd need to send 24 faxes simultaneously. Today you don't need any.

New Delrina Fax Broadcast™ lets you use your Windows PC to send a fax at the same time to a handful of people, or to thousands with a single call. Simply compose your document, then use Delrina WinFax™ 4.0 to make a list of recipients, then send the fax — just once — via fax modem for broadcast over the MCI network. We'll take care of the rest. Call now for $50 of free faxing!*

DELRINA
FAX BROADCAST
1-800-563-0026

*$50 Free Faxing Offer valid within your first 30 days of usage. © 1994 Delrina Fax Broadcast and Delrina Communication Services are trademarks of Delrina (Seattle) Corporation. WinFax is a trademark and Delrina is a registered trademark of Delrina (Canada) Corporation. Delrina Fax Broadcast is offered by Delrina Communication Services an authorized reseller of MCI Telecommunications Corporation. MCI is a registered service mark of MCI Communications Corporation.

Circle 146 on reader service card

COREL

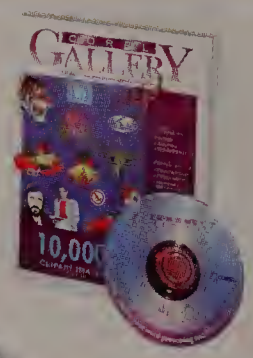
THE BEST VALUE IN CD-ROMS

COREL CD POWER PAK™

- The best multimedia utilities for CD-ROM
- Improve CD-ROM access time with caching software
- Convert and modify photo CD images
- Play and listen to audio CDs: record and edit sound clips
- KOSS™ headphones included
- Also includes 100 royalty free photos and 150 sound clips

$39.90*

COREL GALLERY



- 10,000 "drag and drop" or "cut and paste" clipart images (6,000 in color)
- Includes an easy-to-use Visual Clipart Manager
- Unlimited uses—brochures, newsletters, presentations, reports, invitations, memos, ads, and more
- Windows and Macintosh versions available

$49.90*

COREL ArtShow4™

- Over 3,000 CorelDRAW images from the CorelDRAW $1,000,000 World Design Contest
- Learn techniques from the pros and use these images in your desktop publishing projects
- Online MIDI music and a Windows screen saver module included
- ArtShow 2 and ArtShow 3 also available

$29.90*

COREL PROFESSIONAL PHOTOS CD-ROM™

- 100 razor-sharp photographs in the Kodak Photo CD format
- Royalty free and ready for color separation
- Can be converted to a variety of file formats
- Screen saver utilities included
- Hundreds of categories to choose from—and more each month
- PC and Mac compatible

$29.90*

*U.S. funds plus applicable taxes

TigerDirect 1-800-CD-TIGER
1-800-238-4437
Please mention code BLG

Enter the CorelDRAW $1,000,000 World Design Contest and win! (September to March)
To receive a faxed copy of the contest rules and an entry form please call: 1-613-728-0826 ext. 3080, Document #1004.
To leave a message please dial: 1-613-728-0826 ext. 1609.

Circle 67 on reader service card

COREL
1-613-728-37
Ext.

wished to give his company another chance.

Recently, I was shopping for three software upgrades and decided to see what PC Connection had to offer. I called the representative directly and—true to his word—he handled my order in a most satisfactory manner. He sold me the three upgrade packages at company cost. Once again, I'm a satisfied customer, and PC Connection will continue to be my first source for software purchases.

Since I registered my complaint, I felt that I should now register my satisfaction.
Marguerite Sweeney, Ipswich, Massachusetts

The Part Costs as Much as the Whole

Recently, the president of my company told me that the screen on his previous laptop—an IBM ThinkPad 700C—was shattered and that he didn't intend to have it fixed; he had heard that a replacement for the active-matrix screen would be prohibitively expensive.

I couldn't believe it, so I checked it out for myself. All the authorized IBM service centers that I called charged more than $3000 to replace the screen on a $4000 laptop. Again doubting what I heard, I called the IBM parts warehouse in Colorado. To my dismay, they quoted $3201 for the same part. I then asked my local dealer whether the screen was still covered under warranty. The warranty had expired, but the dealer checked with IBM to see what could be done. IBM told him that the screen was never covered under the warranty.

I think anyone considering a laptop should be aware of this and should check what's covered under warranty and how much replacement parts are likely to cost.
Michael Nevins, Houston

Editor's note: An IBM spokesperson told us that the active-matrix screen is the most expensive part of the ThinkPad 700C and confirmed that $3000 is about the going rate for a replacement. The spokesperson explained that two factors contribute to the high price tag: It's new technology, and the few suppliers worldwide are unable to keep up with the high demand for the product. (IBM offers other ThinkPad models with smaller or monochrome screens.)

It's often cheaper and easier to upgrade to a newer, more powerful notebook than to get new parts for your old one. For those who want to keep the computers they have—or just don't want to pay the high price for new parts—GE Computer Service, one of the largest providers of on-site computer service, has introduced GE Remarketing Service, which offers nearly 900,000 used PCs and computer parts. A GE representative told us that a 486 motherboard costs between about $300 and $2500, depending on how many you buy, the speed of the processor, and the brand name. The company stocks computer equipment from 1500 manufacturers, including IBM, Compaq, Epson, and NEC, and parts for many notebooks (including some batteries and screens, though they do not yet sell IBM ThinkPad screens). GE Remarketing Service also offers technical assistance for installing and troubleshooting the parts it sells. For more information, call 800/431-7671.

Waiting by the Telephone

I purchased my first computer—a Compaq Concerto 486-33 notebook—in December 1993. The first unit I received wouldn't "hibernate" (to conserve the battery). After spending about 2½ hours on hold with Compaq technical support, I was told that the company would send me a disk to help the computer reboot and activate hibernation. Then a battery problem cost me another 10 hours. Finally, Compaq sent me another Concerto, but it also had problems that resulted in another 5 hours on hold.

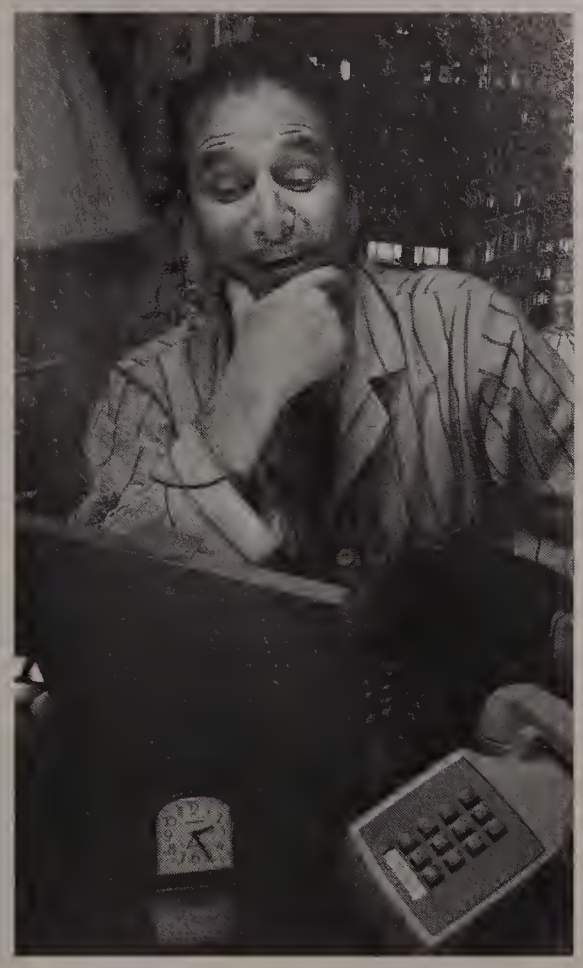
I don't think you should recommend Compaq computers. Each time I've called Compaq, I've had to wait on hold for a minimum of 1 hour to talk to an actual person, who was not always able to fix the problem.
Niki Carrino, Plantation, Florida

POWER TIP no. 310

A Faster Way to WordPerfect for Windows Envelopes

To avoid plowing through layers of menus to get to the WordPerfect for Windows (versions 5.1 and 5.2) envelope printing macro, change the macro name from ENVELOPE.WCM to CTRLE.WCM. Thereafter, press <Ctrl>-E to launch the macro.

William H. Shepherd, Jr.
Alexandria, Virginia



You can't sleep.
You can't call room service.
At least now you can get all your faxes.

Now you can get all your faxes whenever and wherever you travel. When someone wants to send you a fax, they simply send it to your Delrina Fax MailBox™ — using your own personal 800 fax number which we provide.

To instantly retrieve faxes with a PC or laptop simply use Delrina WinFax PRO™ 4.0 and a fax modem. Or just call your 800 number and enter your password to receive them via fax machine. If you have a pager, we'll notify you the instant you get a fax. Order today and we'll give you your first fifty faxed pages free.*

DELRINA®
FAX MAILBOX
1-800-563-0043

*Requires 6 months of continued usage. © 1994 Delrina Fax MailBox and Delrina Communication Services are trademarks of Delrina (Seattle) Corporation. WinFax PRO is a trademark and Delrina is a registered trademark of Delrina (Canada) Corporation.

Circle 37 on reader service card

HIGH-RESOLUTION LASER QUALITY PRINTING IS NO LONGER HIGH PRICED PRINTING. INTRODUCING THE OKIDATA 400e-SERIES.

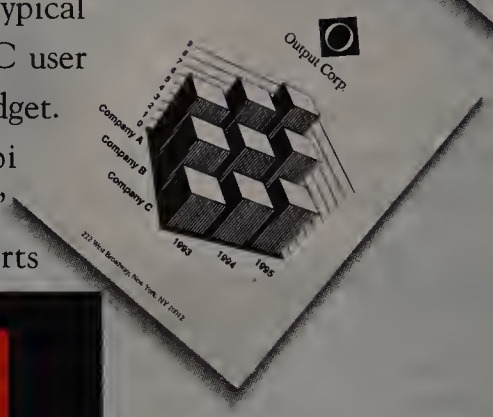
If you thought that outstanding clarity and detail were only possible with a premium-priced laser printer, take a close look at the new OL410e. Now you can produce the same superb output you see here for a lot less. The OL410e is an easy-to-use 600 dpi-class output printer with 4 pages-per-minute speed, at a price well below typical 600 dpi lasers. With the OL410e, any PC user can look *Fortune 500*® on a home office budget.

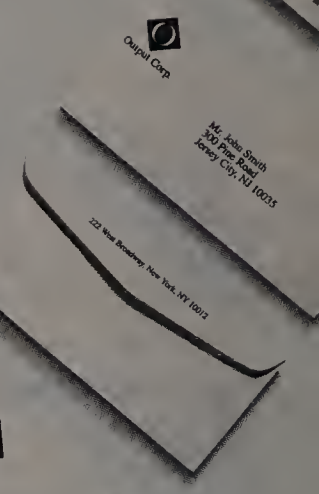
Okidata also offers standout 300 dpi resolution with *PC Magazine's* Editors' Choice winning OL400e. The experts said, "...if you want laser quality, you won't find a better bargain." Both models support Okidata's tradition of reliability with an unsurpassed 5-year LED printhead warranty.

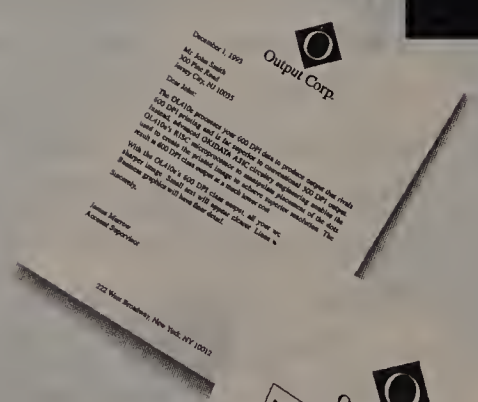
See Okidata 400e-Series print quality for yourself. Call 1-800-OKI-TEAM ext. 500 (U.S. or Canada) for your nearest dealer. You'll find values that make your output stand out.

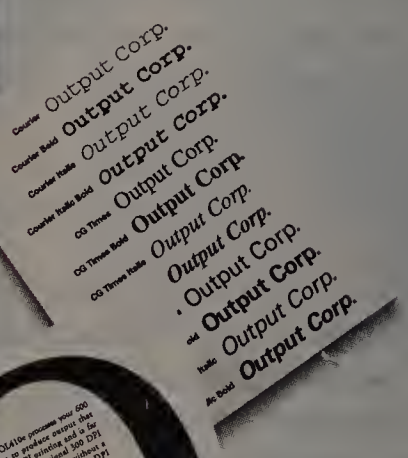
YOUR BUSINESS HAS NEVER LOOKED BETTER.™

Stand Out

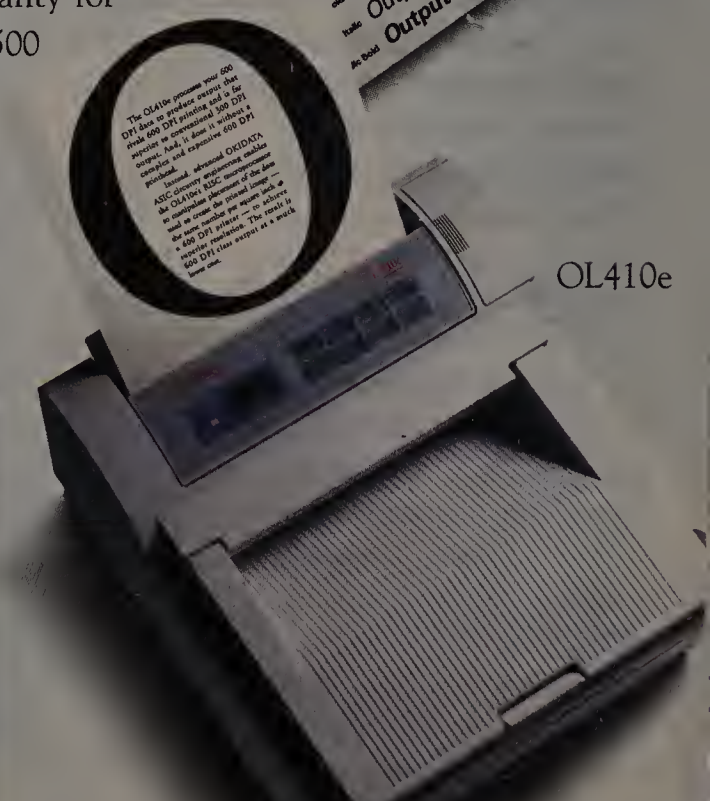








OL400e



OL410e

PC MAGAZINE EDITORS' CHOICE Nov 23 1993 Okidata OL400e

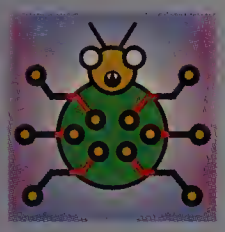
The New OKIDATA 400e Series Personal Printers.

Okidata Reg. T.M., M.D. Oki Electric Industry Co., Ltd. "Your Business Has Never Looked Better" T.M. Oki America, Inc.

Circle 140 on re ervice card

OTLINE: INSTANT FAX BACK
1-800-234-0455 ext. 238

BUG WATCH



Microsoft Excel 5.0

In May, Microsoft posted 39 Excel 5.0 bugs reported by users. Many of them are related to OLE procedures, incompatibilities between Excel versions, or functions that don't perform as expected; they can cause incorrect on-screen formatting, dialog boxes that don't work, or difficulty printing. Some cause General Protection Faults (GPFs) that can result in the loss of unsaved data.

Find a list of the bugs in the Microsoft Knowledge Base on CompuServe (GO MSKB) in document Q112180, "XL5: Summary List of Known Bugs."

Meanwhile, Microsoft has announced an interim version, Excel 5.0c. The company says version 5.0c includes new features (such as support for Lotus Notes FX) and changes to the interface that synchronize Windows and Macintosh versions.

5.0c fixes these three common bugs:

- If you run a Visual Basic procedure that uses the SQLExecQuery or SQLRequest functions to query an external data source, and your query is larger than 255 characters, you may get a GPF.
- You can't reference a name on a closed Excel 4.0 workbook if the name is not defined on the first worksheet.
- When you use the horizontal scroll bar under the preview window in the Text Import Wizard to scroll the columns in a text file, you may experience a GPF.

As we went to press, Microsoft had not finalized plans for distributing the 5.0c upgrade, but a company source stated that it would be too large to download and would likely be mailed. Call Microsoft customer service at 800/426-9400.

WinComm Pro 1.0

Delrina recently released WinComm Pro 1.0b, a downloadable patch file that fixes several bugs in the first version of the program. The corrected bugs include problems with printing when using certain terminal emulations, difficulty in entering serial numbers during product registration, lack of support for numeric session names, glitches when buttons are added to the program's tool bar, file corruption during transfers using the Kermit protocol, and unexpected 'Path not found' errors when exiting from Chat mode in host-mode sessions.

The patch also provides new features: one that lets you specify how long WinComm Pro will wait before returning port control to the WinFax Pro or WinFax Lite fax software; a larger scroll-back buffer; and the ability to launch COM, BAT, and PIF files using the Run command.

Find the self-extracting archive file (WCP001.EXE) on CompuServe (GO DELRINA) or Delrina's BBS (416/441-2752). Or call Delrina (416/443-4395).

Correction: Contrary to a statement in June's *Bug Watch*, versions 4.0 and 5.0 of Microsoft Excel don't automatically open files named STARTREK.XLS stored in the main Excel program directory. In fact, when you launch these versions of Excel, they open the files in that directory that begin with the letters START.

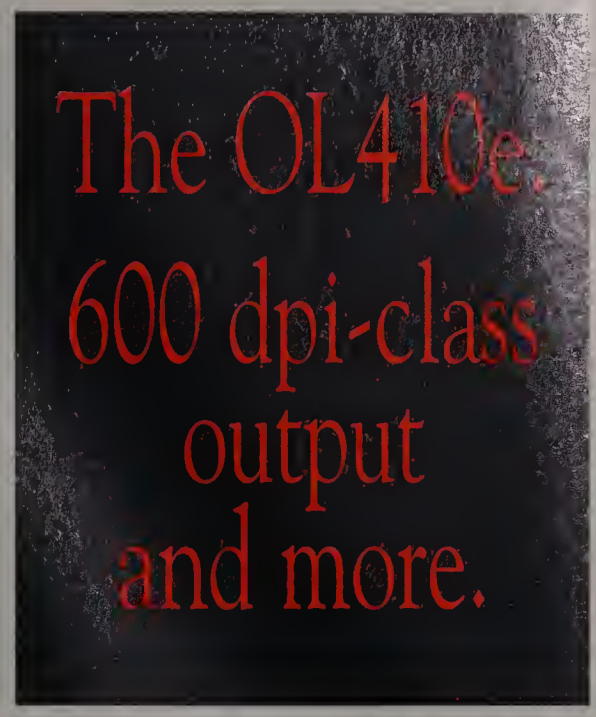
—Scott Spanbauer

Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with the details. We'll investigate problems and report on those with the broadest interest. Due to the volume of queries, we may not be able to return your call, and can't provide technical support.

Scott Spanbauer is a contributing editor for PC World.

Editor's note: When we got Carrino's letter, we contacted Compaq. A spokesperson admitted that the company "did have long waits on the portable-PC support line earlier this year," but he also added that the issue is "pretty much resolved." Just to be sure of this, we double-checked with the *PC World* reviews staff, which routinely checks technical support as part of reviewing a product. Our staffers report that the average wait for Compaq is now about 7 minutes. (I got through on the first try.)

Shop Talk is written and researched by PC World *associate editor Christina Wood. Think you've gotten a raw deal—or a great one?* Consumer Watch *wants to hear the details. We'll investigate complaints and publish letters with the broadest interest (see page 10 for contact information).*



Okidata Reg. T.M., M.D. Oki Electric Industry Co., Ltd.

Look for us on all the major networks.

Word about PCs from Hewlett-Packard is getting around, and ratings are soaring. According to a recent CRN/Gallup survey, "Use of HP desktops in Fortune 1000 companies has doubled in the last year."[‡]

And with good reason. Our broad range of PCs not only meets users' expectations for power and ease of use, it also answers the needs of a network manager. With built-in features like on-board networking, advanced security and asset tracking, HP PCs have what it takes to be top performers on virtually any network. And soon our expertise in network management will reach all the way to the desktop, as we continue to pioneer the development of DMI (Desktop Management Interface).

For more information or the name of your nearest HP dealer, call us today at 1-800-322-HPPC, Ext. 8324. And tune in to the network superstars.

HEWLETT® PACKARD

Give your other PCs something to look up to.

If you're connecting PCs to a network, scan this chart and you'll see it's time to hook up with HP.

STANDARD NETWORKING FEATURES	HP VECTRA M2 PC	COMPAQ DESKPRO/XE	DELL NETPLEX
Advanced Bus Architecture	VL-bus		
Integrated Networking Interface	16-bit		
Integrated, multiprotocal Boot-ROM	X		
ISA Plug-n-Play Compliant	X	X	
Multilevel Security Features	X	X	X
Asset tracking	X	X	
PC tattooing	X	X	
Optional Desktop Management Software	X		
Bi-directional parallel port	X	X	X
Desktop Management Interface (DMI)[3]	X		

HP quality in value-priced PCs.

- *Intel 486SX, 486DX2 and DX4*
- *Chip upgrades to higher performance*
- *On-board accelerated local-bus video*
- *210-MB hard drive*[1]
- *4-MB RAM, expandable to 64-MB*
- *512-KB or 1-MB of Video RAM standard*
- *ISA Plug-n-Play compliant*
- *Desktop Power Management*
- *EPA Energy Star certified*

High-performance network-ready PCs in a slimline package.

- *Intel 25- and 33-MHz 486SX, 50- and 66-MHz 486DX2, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *170-MB, 14-ms Fast-IDE hard drive*
- *32-bit Fast-IDE local-bus hard disk interface*
- *4- or 8-MB RAM, expandable to 96-MB*
- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*

High-performance PCs for the connected office

- *Intel 33-MHz 486SX; 50- and 66-MHz 486DX2, 100-MHz DX4, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *Four mass storage shelves; four expansion slots*
- *One available 32-bit VL-bus slot*
- *210-MB, 14-ms Fast-IDE hard drive*
- *32-bit Fast-IDE local-bus hard disk interface*
- *8-MB RAM, expandable to 96-MB*

Top performance for experts in connected environments.

- *Intel 60-MHz Pentium with 256-KB write-back cache*
- *One PCI slot, one shared PCI/ISA slot, two ISA slots*
- *Four mass storage shelves*
- *270-MB Fast-IDE hard drive with 12-ms access time*[1]
- *Integrated S3 928PCI graphics accelerator*
- *2 MB of VRAM expandable to 4 MB, 1600 x 1200 video resolution*
- *8-MB RAM, expandable to 192-MB*

HP Vectra VL2

- *Local bus Fast-IDE hard disk interface**
- *1280 x 1024 video resolution**
- *Optional 128- or 256-KB cache memory**
- *Free three-year limited warranty for parts and labor*[2]

from
$1,099†

HP Vectra N2

- *1 MB of video RAM standard, expandable to 2 MB*
- *Slimline package with two mass storage shelves and three ISA slots*
- *Optional integrated 10Base-T networking*
- *Multilevel security*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)*[3]
- *Free three-year limited warranty for parts and labor*[2]

from
$1,309†

HP Vectra M2

- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*
- *Optional integrated 10Base-T networking*
- *Systems Diagnostics Utility*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)*[3]
- *Free three-year limited warranty for parts and labor*[2]

from
$1,679†

HP Vectra XP

- *Integrated 16-bit 10Base-T networking interface with bus-master DMA*
- *Flash EPROM*
- *Systems Diagnostics Utility*
- *Power-on Self Test*
- *Multilevel security*
- *Asset tracking with non-erasable serial number and customizable PC tattooing*
- *Bi-directional parallel ports*
- *Free three-year limited warranty for parts and labor*[2]

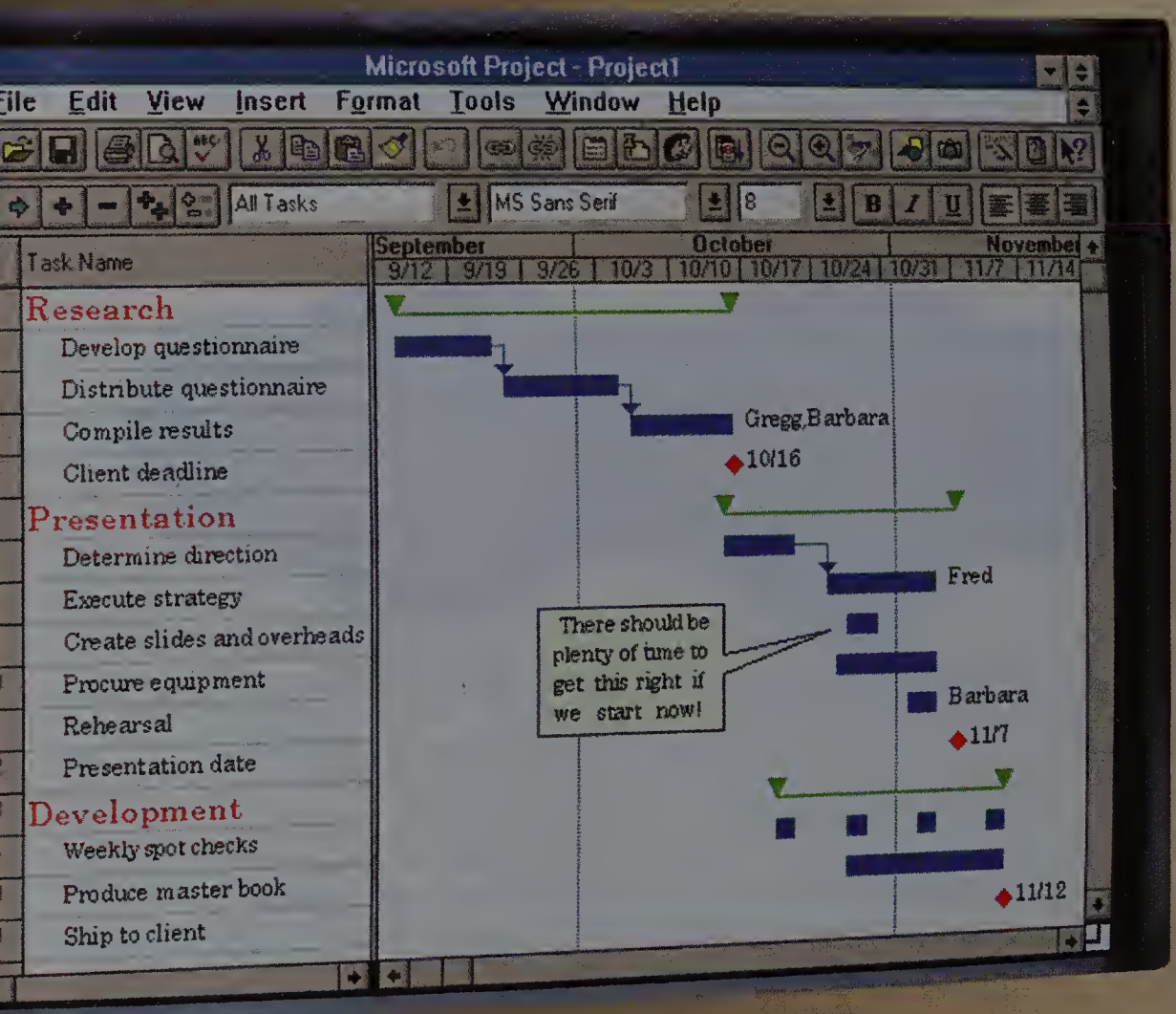
from
$3,559†

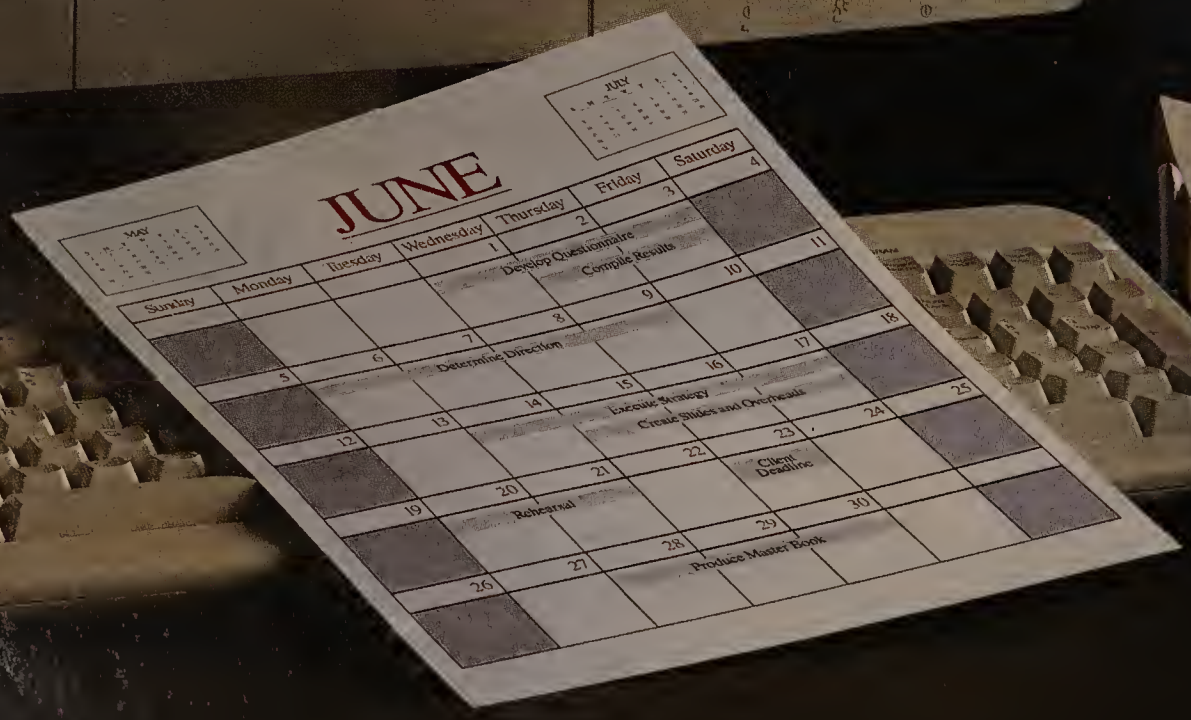
intel inside

yes NetWare Tested and Approved

All HP Vectra PCs come with MS-DOS® 6.2 and MS Windows for Workgroups 3.11 pre-installed; HP mouse and keyboard included. *Feature included with some models. †List price, dealer prices may vary. Monitor not included. [1]Other capacities available. [2]First year on-site, 24-hour service. Second and third year return to dealer. [3]Available 9/1/94. ‡With permission CRN/Benchmark. MS-DOS is a U.S. registered trademark and Windows is a trademark of Microsoft Corporation. Pentium and the Intel Inside logo are U.S. trademarks of Intel Corporation. PPG403 ©1994 Hewlett-Packard Company

THE CALENDAR HAS BEEN AROUND FOR 6,000 YEARS. WE FELT IT WAS TIME TO IMPROVE IT.





Introducing new Microsoft® Project version 4.0.

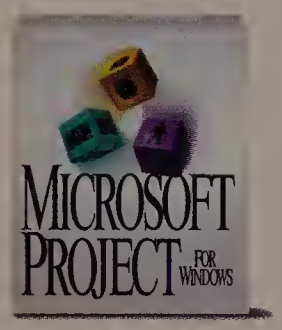
As long as people have had things to plan, they've always looked for better ways to organize and manage the process.

Now there's software that helps you do it more effectively than ever.

It helps you plan, manage and communicate with ease.

With new Microsoft Project, planning is easier than you ever imagined. Simply type a list of what's to be done. By whom. And how long they'll need.

Your plan is automatically converted to easy-to-read reports. Calendars. And charts. (Like the examples you can see at the left.)



The world's most popular business project planning software just got better with Microsoft Project version 4.0.

It watches how you work and guides you step by step.

Like other programs in the Microsoft Office family, Microsoft Project features IntelliSense™ technology. Simply stated, your software now senses what you want to do and helps you do it.

For example, PlanningWizards offer suggestions as you go, to help you avoid problems down the line.

Cue Cards help you set up your plan with step-by-step instructions that stay on the screen as you work.

With GanttChartWizards, you just choose a great-looking format and it does the rest. (Just like the ChartWizard in Microsoft Excel.)

What's this all mean? Simply that you can get started right away. And learn as you go along.

Now it's easy to keep everyone in the loop.

Chances are you're not the only one working on the project. Microsoft Project was developed with this in mind.

You can now distribute reports through your existing electronic mail system*. Click on a button to collaborate. Click to delegate. Click to get the status of your plan. Even set reminders on important tasks.

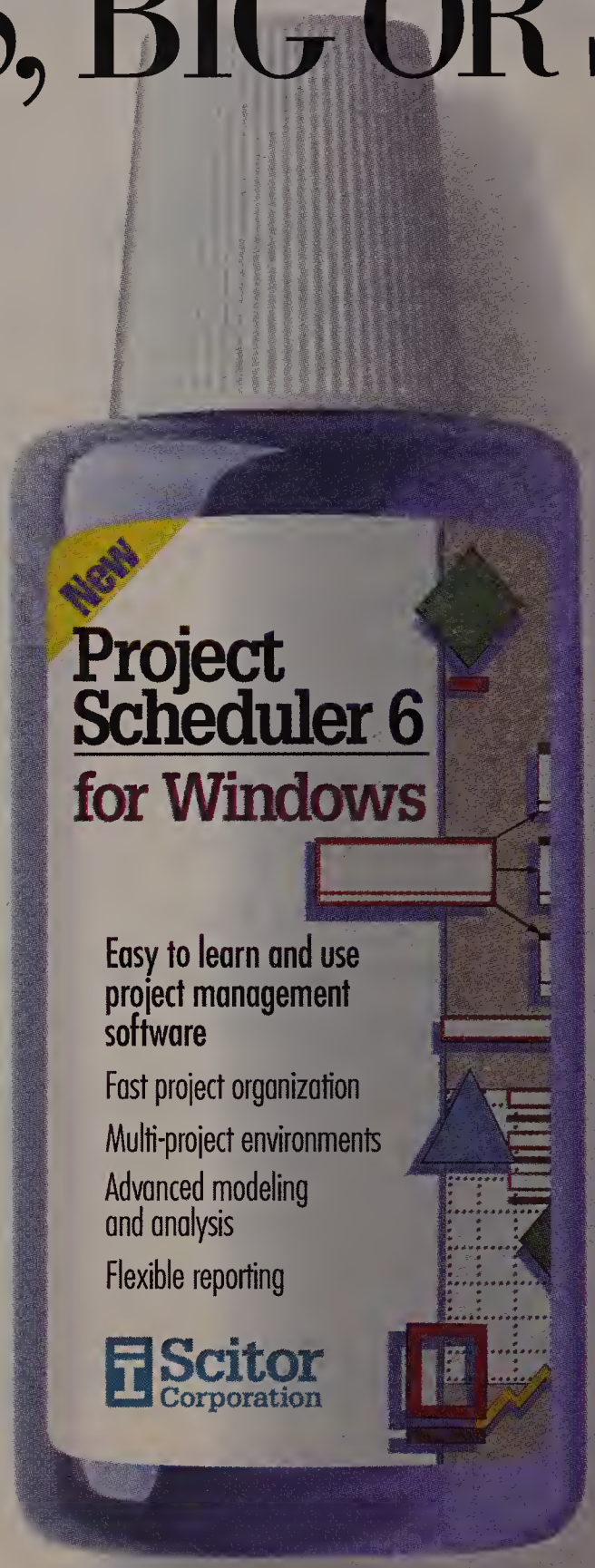
To do all this (and a lot more) all you have to do is take the first step: Call Microsoft at (800) 671-3955, Dept. KZ5, for more information or for the name of a reseller near you.

You'll wonder how you ever managed without it.

Microsoft®

*Some workgroup features require MAPI-compliant mail systems, acquired separately. © 1994 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark and IntelliSense is a trademark of Microsoft Corporation. In the 50 United States, call (800) 671-3955, Dept. KZ5. Customers in Canada, call (800) 563-9048. Outside the 50 United States and Canada, call your local Microsoft subsidiary or (206) 936-8661.

FAST RELIEF FOR PROJECT MANAGEMENT STRESS, BIG OR SMALL.



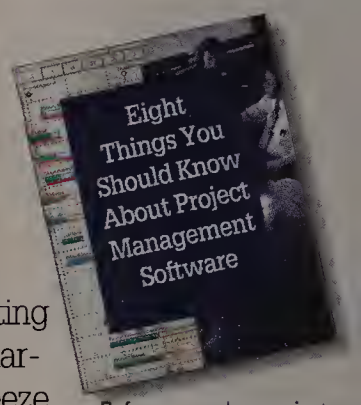
In the real world of project management, the only constant is change. Managers are faced with coordinating more activities in less time, with tighter budgets, and workgroups spread out across the building and around the world. So what can managers at all levels of experience count on to keep them up to date and in control – Project Scheduler 6 for Windows!

Unlike many software programs that claim to be easy to use, Project Scheduler 6 for Windows really is, and the experts agree. According to a recent *InfoWorld* review; **"Project Scheduler's interface is a joy to use...Scitor understands how people use project management software."**[1]

But Project Scheduler 6 offers managers more than just relief from occasional project stress.

"Project Scheduler 6 surpasses Microsoft Project and CA SuperProject – in addition to challenging many high end packages." wrote *InfoWorld*.[2]

Sophisticated modeling features, like the Advanced Resource Tracking Spreadsheet (ARTS)™ let you evaluate resource costs and usage on a period by period basis using a familiar spreadsheet format. Evaluating "what-if" scenarios is also a breeze with Project Scheduler's ability to perform multiple undo/redos in seconds.



Before you make a project management software decision, call for this free executive summary.

Call 415-570-7700

Our software's built-in object-oriented report writer provides extraordinary flexibility and convenience. And as the first project management software to share information with other ODBC-compliant applications, it even helps build greater reporting and data management efficiency throughout the enterprise.

So, as *Windows Magazine* recently put it **"If you're seeking a Windows project management product that does it all and then some, Project Scheduler 6 fills the bill."**[3]

Scitor Corporation

© 1994, Scitor Corporation. 393 Vintage Park Drive, Suite 140, Foster City, CA 94404. Tel. 415-570-7700. In France, call (1) 43 29 44 37. In Germany, call 0 69- 6 66 80 25. In the United Kingdom, call 0562-882125. Project Scheduler 6, ARTS, and the Scitor name are trademarks of Scitor Corporation. Windows is a trademark of Microsoft Corporation. [1]InfoWorld, August 9, 1993. [2]InfoWorld, January 3, 1994. [3]Windows Magazine, November 1993.

Circle 236 on reader service card

Auto Execs

For most managers, creating a report is a crazy-quilt process. You spend long hours pulling numbers from a database or crunching them in spreadsheets, cutting and pasting them into a word processing file, and routing the product through E-mail. All are vital tasks, but they beg for automation. This month, Lee Allen, a manager in Schering-Plough's Contracts and Information department in Union, New Jersey, tells how he uses an off-the-shelf software package to save his pharmaceutical manufacturing company an estimated $180,000 in labor every month. —*Ed.*

Contract-itis

In my 36-person department, 8 people support nearly 60 field personnel who work with organizations in the managed care segment of the health care industry (HMOs, nursing homes, hospitals, and the like). The field staff uses the information we give them to negotiate contracts for purchasing drugs. The object of the game is to see that Schering-Plough is on their lists of approved pharmaceutical providers.

Two years ago, when I began working at this $4.3 billion, 22,000-employee company, managed care contracts accounted for 20 percent of our business. This year they'll account for over half, in part because managed care is a key component of the government-sponsored health care reform plan.

The Run-Around

Our group is made up of business analysts meant to work behind the scenes helping field personnel negotiate contracts. But because we know how to access the corporate mainframe database and field personnel don't, we end up being an administrative arm as well.

Until recently, a representative would call in to find out when an HMO's contract expired or what its sales volume was. We'd access information from the mainframe and call the rep back with the answer. Fifteen minutes later, another person would call with the same question on another account, and we'd go through the identical process again.

Because our in-house staff is versed in Excel, WordPerfect, and other applications (the field force is not), we had to pull this data into presentations, contracts, and other documents. After getting data on a customer from the mainframe, we would often have to crunch the numbers in Excel, copy the data to a word processing file, then import portions into a presentation. Finally, we would print the whole thing and ship it to the field representative, who would invariably want to make changes. This usually meant doing the contract all over again. Multiply that by 75 contracts per month, and you get the picture.

Meanwhile, our managed care business grew 200 percent in two years. And like other corporations, we were downsizing. We didn't have the personnel to support the demand: The labor required to support one representative cost around $4000 a month.

We needed to automate the process so field representatives could assemble their own information. But how? Teaching them to access the mainframe and use a word processor or spreadsheet was out of the question: They were there to manage contracts, not learn software.

An Application Daisy Chain

Earlier this year, we discovered a Windows product that helped solve the problem: ProdeaSynergy 2.0 from Prodea Corporation (800/776-3321). It provides a remarkable way to connect applications so they all work cooperatively together. (ProdeaSynergy sells for $295 through September and $495 thereafter.)

Lee Allen is a manager with Schering-Plough in Union, New Jersey.

I know nothing about linking tools like DDE or OLE, but I found ProdeaSynergy easy to use. I taught it to do what I normally had to do to get information from the corporate database into the presentation package—via Excel and Word.

I did this by simply connecting a set of icons—one icon for the communications software that connects us to the mainframe, one for the database query tool, one for the spreadsheet, one each for the word processors, and one for the presentation graphics package. (When you draw an arrow between these standard Windows icons in ProdeaSynergy, the program knows to shift data from one application to another.)

For example, I dragged the communication icon tool into a work space to establish a connection to the mainframe. Then I dragged the data query

Save Disk Space

PKZIP®

PKZIP version 2.0

PC WORLD WORLD CLASS AWARD

PKWARE® introduces the next generation of its award winning compression utility. PKZIP 2.0 yields greater performance levels than achieved with previous releases of the software. PKZIP compresses and archives files. This saves disk space and reduces file transfer time.

Software developers! You can significantly reduce product duplication costs by decreasing the number of disks required to distribute your applications. Call for Distribution License information.

Put Your Executables on a Diet

Software developers! Save disk space and media costs with smaller executables. You can distribute your software in a compressed form with PKLITE Professional.™ PKLITE Professional gives you the ability to compress files so that they cannot be expanded by PKLITE.™ This discourages reverse engineering of your programs.

PKLITE increases your valuable disk space by compressing DOS executable (.EXE and .COM) files by an average of 45%. The operation of PKLITE is transparent, all you will notice is more available disk space!

Compression for YOUR Application

The PKWARE Data Compression Library™ allows you to incorporate data compression technology into your software applications. The application program controls all the input and output of data, allowing data to be compressed or extracted to or from any device or area of memory.

All Purpose Data Compression Algorithm compresses ASCII or binary data quickly. The routines can be used with many popular DOS languages. A Windows DLL and an OS/2 32-bit version is also available!

PKWARE® INC.

The Data Compression Experts

9025 N. Deerwood Drive Brown Deer® WI 53223-2437
(414) 354-8699 Fax (414) 354-8559

PKWARE Data Compression Library for DOS $275 PKWARE Data Compression Library for OS/2 $350
PKWARE Data Compression Library DLL for Windows $350
PKZIP $47.00 PKLITE $46.00 PKLITE Professional $146.00
Please add $5.00 S&H per package in the US & Canada, $11.25 overseas.
Wisconsin residents add appropriate state sales tax & county sales tax.
Visa and Mastercard accepted, no COD orders.

PCW9/94

Circle 212 on reader service card

icon into the work space, drew a line between the two icons, and opened the data access tool. I put in a command to query the database about a common question. Next, I drew a line from the data access tool to the Excel icon.

I opened a file in Excel, applied some formatting macros to a certain range, and closed it. I drew an arrow from the Excel icon to the Word for Windows icon, opened up a file in Word, and created a bookmark where I wanted the Excel range to go to create our standard memo.

ProdeaSynergy automatically activates the data query tool, fetches the data, and passes it to the appropriate Excel range. There, a macro sets a print range and moves the data into Word, where it gets formatted.

Back to Brain Work

What happens on the representatives' end is even simpler. Using their laptops, they double-click an icon in the ProdeaSynergy library called Managed Care Groups. A menu of report names appears, such as account utilization or contract performance. (To date, we have automated 20 reports.) They click on a report topic and are presented with a list of account names. Once they click on a Run button, the product automatically pulls everything they need together in one neat, tidy Word, Excel, or Harvard Graphics document. If they need to further manipulate the data, they can.

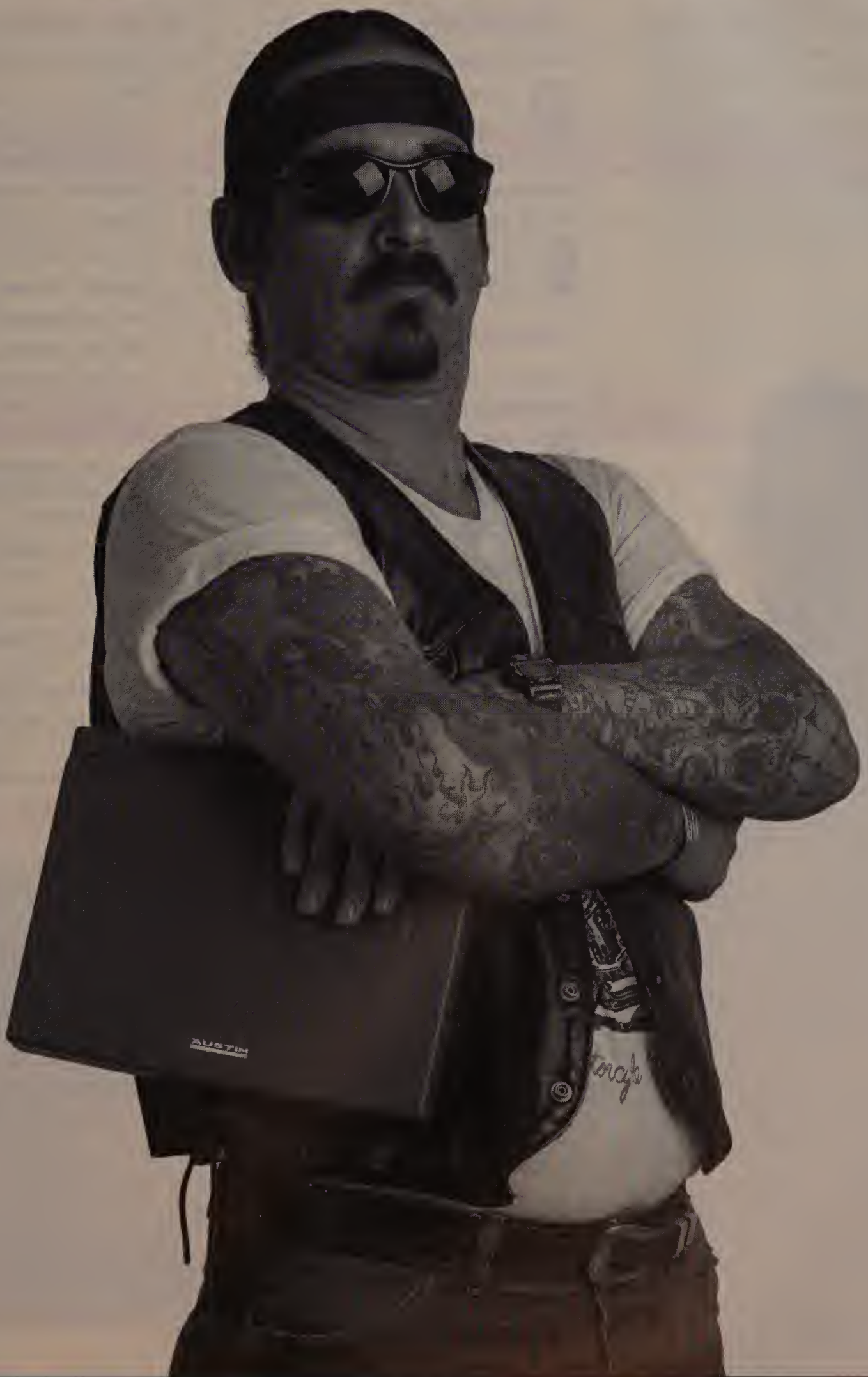
By automating the information access and report formatting for the representatives, an eight-person team can now support 60 field personnel instead of only 15. The price of supporting a representative has been lowered by $3000, to $1000 per month, and the representatives can get answers to most questions themselves. Our solution has improved communication, because everyone uses the same standard reports.

Finally, we have our jobs back: Instead of fetching data, we're working as business strategists. We spend more time helping field managers work on pricing and tactical issues, and a lot less on cutting and pasting.

Edited by Bronwyn Fryer

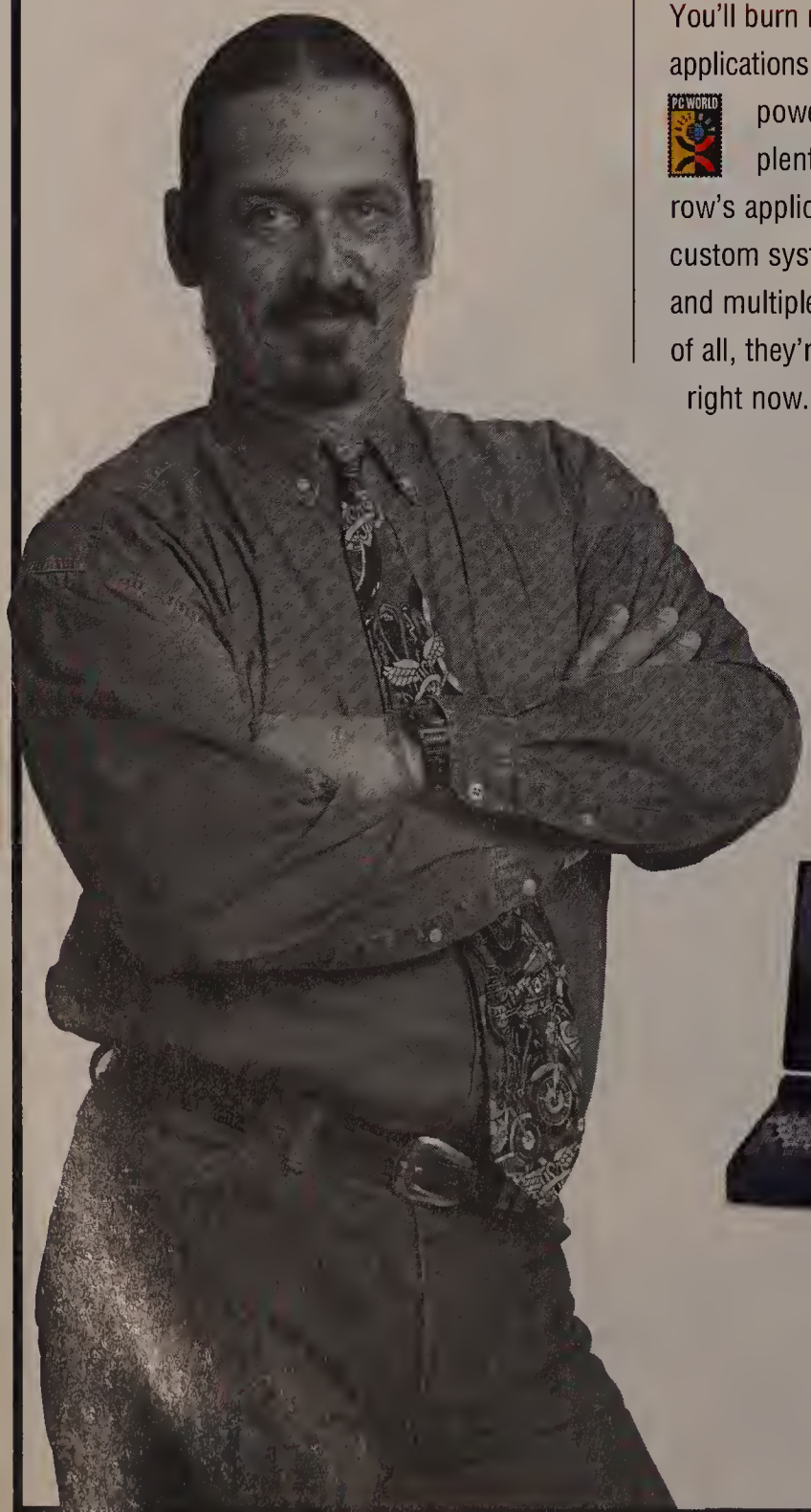
Bronwyn Fryer is a contributing editor for PC World. *If you use PCs to manage people and other resources in a business environment, we want to hear from you. See page 10 for contact information.*

EARL HAS SOME BUSINESS TO TAKE CARE OF.



AT THE OFFICE OR ON THE ROAD, HE TURNS TO AUSTIN DIRECT.

At home or on the road, Earl gets the job done. Because he turned to Austin Direct for the tools he needs. Like a racy little notebook for when it's time to hit the street. And a speedy desktop system for when he's hanging out at the office.



DX4-DRIVEN NOTEBOOKS. COOL.

For the ultimate in laptop performance, MARCH 1994 BYTE choose Austin's new DX4-powered notebooks. Intel's DX4 chip is the most powerful technology available for notebooks today. BEST Home Office BUY And our laptops have the expandability and flexibility that make them a tough gang to beat. CBG &H BEST BUY

PENTIUM-BASED DESKTOPS. RAW POWER.

You'll burn rubber through today's desktop applications with Austin's new Pentium-powered desktop computers. With plenty of power to handle tomorrow's applications too. Austin Direct offers custom systems, flexible configurations, and multiple upgrade options. And best of all, they're affordable – and available right now. PC WORLD

intel inside

KILLER SERVICE AND SUPPORT.

- An average tech support response time of *under two minutes*
- Award-winning systems
- Top rated service and support
- Lifetime tech support seven days a week, *twenty-four hours a day*
- Two year warranty on desktop systems: first year on-site, second year parts and labor
- One year warranty on notebooks
- 30-day money back guarantee

THE WORD'S OUT ON THE STREET.

"...among the new class of portables, these fine components add up to a hard-to-beat combination."

PC Magazine, December 1993

"Blazing Performance."

Windows Magazine, January 1994

"If you're looking for the most speed and capacity for your dollar, this is the system for you."

Home Office Magazine, March 1994

CHOOSE ONE THAT'S RIGHT FOR YOU.

$1,489 GENESIS 486DX2-66

- Intel 486DX2-66 Processor
- 4 MB RAM, 128 KB Cache
- 212 MB Hard Drive
- 1 MB Local Bus Windows Accelerator for 1024 x 768
- 3.5" 1.44 MB Diskette Drive
- 14" SVGA Monitor
- 5 16-bit ISA Slots
- 101-Key Keyboard & Mouse
- MS-DOS 6.21, Windows 3.11, & MS Works 3.0
- EPA Energy Star Compliant
- Lease $62/mo.

$2,099 THE EDUTAINER

- Intel 486SX-33 Processor
- 8 MB RAM, 128KB Cache
- 212MB Hard Drive
- 1 MB Local Bus Windows Accelerator for 1024 x 768
- 3.5" 1.44 MB Diskette Drive
- 14" SVGA Monitor, 16-bit Sound Card
- Video playback using MPEG1
- Sony Double-Speed CD-ROM
- 5 16-Bit ISA Slots
- 101-Key Keyboard,Mouse, & Speakers
- MS-DOS 6.21, Windows 3.11, & MS Works 3.0
- EPA Energy Star Compliant
- Lease $83/mo.

$1,669 PREMIER 486DX2-66

- Intel 486DX2-66 Processor
- 8 MB RAM, 128 KB L2 Cache
- 425 MB Hard Drive
- 1 MB Local Bus Windows Accelerator for 1024 x 768
- 3.5" 1.44 MB Diskette Drive
- 14" SVGA Monitor
- 2VL and 5 16-bit ISA Slots
- 101-Key Keyboard & Mouse
- MS-DOS 6.21, Windows 3.11, & MS Works 3.0
- EPA Energy Star Compliant
- Lease $78/mo.

1,999 POWER SYSTEM-60

- Intel 60MHz Pentium Processor
- 8 MB RAM, 256 KB L2 Cache
- 425 MB Hard Drive
- PCI-Bus Windows Accelerator with 1 MB
- 3.5" 1.44 MB Diskette Drive
- 14" SVGA Monitor
- 2 PCI, 1 PCI/ISA and 4 ISA Slots
- 101-Key Keyboard & Mouse
- MS-DOS 6.21, Windows 3.11, & MS Works 3.0
- Lease $83/mo.

$2,149 POWER SYSTEM-66

- Intel 66 MHz Pentium Processor
- 8 MB RAM, 256 KB L2 Cache
- 425 MB Hard Drive
- PCI-Bus Windows Accelerator with 1 MB
- 3.5" 1.44 MB Diskette Drive
- 15" NI SVGA Monitor
- 2 PCI, 1 PCI/ISA and 4 ISA Slots
- 101-Key Keyboard & Mouse
- MS-DOS 6.21, Windows 3.11, & MS Works 3.0
- Lease $95/mo.

$2,699 POWER SYSTEM-90

- Intel 90 MHz Pentium Processor
- 8 MB RAM, 256 KB L2 Cache
- 425 MB Hard Drive
- PCI-Bus Windows Accelerator with 2 MB
- 3.5" 1.44 MB Diskette Drive
- 15" NI SVGA Monitor
- 2 PCI, 1 PCI/ISA, and 4 ISA Slots
- 101-Key Keyboard & Mouse
- MS-DOS 6.21, Windows 3.11, & MS Works 3.0
- Lease $107/mo.

$3,399 AUSTIN PCI-P5 SERVER

- Intel 66 MHz Pentium Processor
- 16 MB RAM, 256 KB L2 Cache
- 1.08 GB SCSI-2 Hard Drive, SCSI-2 Controller
- 3.5" 1.44 MB Diskette Drive
- 14" SVGA Monitor
- 1 MB Video Adapter
- 10-BASE T Ethernet Adapter
- Tower Case, 8 Drive Bays
- 2 PCI, 1 PCI/ISA, and 4 ISA Slots
- 101-Key Keyboard & Mouse
- MS-DOS 6.21
- Lease $143/mo.

System Upgrades

- Multimedia Kit (Double Speed CD-ROM, Media-Magic ISP-16 Sound Card, and Speakers), $259
- 425 MB to 540 MB hard drive upgrades, $90
- 15-inch monitor upgrade from 14-inch, $90
- Double Speed CD-ROM, $159

(Only with system purchase.)

We can build a custom system to your specifications! Ask your Austin Direct sales representative about additional hard drive, RAM, and processor options.

Austin Notebooks

- Intel 486SX, DX2 or DX4 Processors
- 4 MB or 8 MB RAM Expandable to 32 MB
- 127 MB to 524 MB IDE Drive, User Replaceable
- 3.5" 1.44 MB Diskette Drive
- Local Bus Video with 1 MB VRAM
- Local Bus IDE
- 9.5" Monochrome, DSTN or TFT Active Color Screen
- 2 Type II or 1 Type III PCMCIA Slots
- Integrated 16mm Trackball
- DX4 Series: 16-Bit Business Audio Features Including Built-In Microphone and Speaker, External Jacks for Line In and Line Out
- EPP/ECP Parallel Port, 16550 High Speed Serial Port
- Advanced Power Management
- 1 Parallel, 2 Serial, Keyboard Port, VGA Port
- Dimensions: 11.1" x 8.58" x 2"
- Weight: 6.3 lbs. with battery

Road Warrior Package

- Premium Notebook Carrying Case
- 14.4 Internal Fax/Modem
- Car Power Adapter
- External Charger *Package Price, $490*
- NiMH Spare Battery Back *(Separately, $585)*

Dual Scan Screen

$2,029 AUSTIN 486SX-33
- 4 MB RAM and 262 MB Hard Drive
- Lease $81/mo.

$2,229 AUSTIN 486DX2-50
- 4 MB RAM and 262 MB Hard Drive
- Lease $89/mo.

$2,579 AUSTIN 486DX2-66
- 8 MB RAM and 340 MB Hard Drive
- Lease $94/mo.

$2,849 AUSTIN 486DX4-75
- 8 MB RAM and 340 MB Hard Drive
- Lease $113/mo.

$3,199 AUSTIN 486DX4-100
- 8 MB RAM and 524 MB Hard Drive
- Lease $127/mo.

Active Matrix Screen

$3,145 AUSTIN 486SX-33
- 4 MB RAM and 262 MB Hard Drive
- Lease $125/mo.

$3,299 AUSTIN 486DX2-50
- 4 MB RAM and 262 MB Hard Drive
- Lease $131/mo.

$3,489 AUSTIN 486DX2-66
- 8 MB RAM and 340 MB Hard Drive
- Lease $139/mo.

$3,899 AUSTIN 486DX4-75
- 8 MB RAM and 340 MB Hard Drive
- Lease $155/mo.

$4,099 AUSTIN 486DX4-100
- 8 MB RAM and 524 MB Hard Drive
- Lease $127/mo.

Monochrome Screen

$1,439 AUSTIN 486SX-33
- 4 MB RAM and 127 MB Hard Drive
- Lease $57/mo.

$1,739 AUSTIN 486DX2-50
- 4 MB RAM and 262 MB Hard Drive
- Lease $69/mo.

$1,899 AUSTIN 486DX2-66
- 4 MB RAM and 340 MB Hard Drive
- Lease $76/mo.

Notebook Accessories

4 MB RAM, $219; 16 MB RAM, CALL; Docking Station, $299; Car Adapter, $59; PCMCIA 14.4 Fax/Modem, $299; Built-In 14.4 Fax/Modem, $199; PCMCIA Ethernet Adapter, $220
(Only with system purchase.)

Ask your Austin Direct sales representative about additional configurations.

intel inside

Novell Gold Authorized Reseller

PC WORLD BEST BUY

PC WORLD BEST SERVICE AND BEST SUPPORT

MICROSOFT WINDOWS READY-TO-RUN

AUSTIN QUALITY
Recipient of 1993 Austin Commitment to Quality Award from the City of Austin

SERVICE & RELIABILITY PC MAGAZINE READERS' CHOICE

AUSTIN DIRECT

1-800-752-1577

Ad Code: PCWD0994

DISCOVER NOVUS VISA MasterCard American Express

©1994 Austin Direct. All rights reserved. The Intel Inside logo is a registered trademark of Intel Corp. Intel DX4, DX2, DX are trademarks of Intel Corp. Microsoft is a registered trademark and Windows and the Windows logo are trademarks of Microsoft Corp. All other company names and products are trademarks or registered trademarks of their respective owners. The above are special promotional prices. Prices and specifications are subject to change without notice. We are not responsible for errors in typography and photography. *Lease term reflects 36-month contract.

2121 Energy Drive, Austin, Texas 78758
512-339-3500 • FAX 512-454-1357

Government Sales: 1-800-833-4472
Fortune 1000 Sales: 1-800-622-5506
For More Information By Fax: 1-800-341-7500

Circle 22 on reader service card

When all else fails,

Starting at $139!

There are three types of computer users: those who have lost data due to a power problem, those who are going to, and those who have protected themselves against the inevitable surge, blackout or brownout with the most reliable UPS they can buy: Back-UPS by APC. In fact, editors and users alike agree that if your system demands absolute reliability, you can depend on APC Back-UPS.

According to a study by Bell Labs, undervoltages represent the overwhelming majority of power problems likely to hit your computer. The question is not if a failure will occur, but when. Whether due to construction, wiring, weather, other office equipment, or accidents, power problems are as inevitable as death and taxes. That's why you need instantaneous battery backup power from the Back-UPS to prevent data loss, hard disk crashes, and hardware damage.

If you're concerned about lightning, rest assured that when measured using the ANSI/IEEE 587 Category A test wave, Back-UPS are superior to

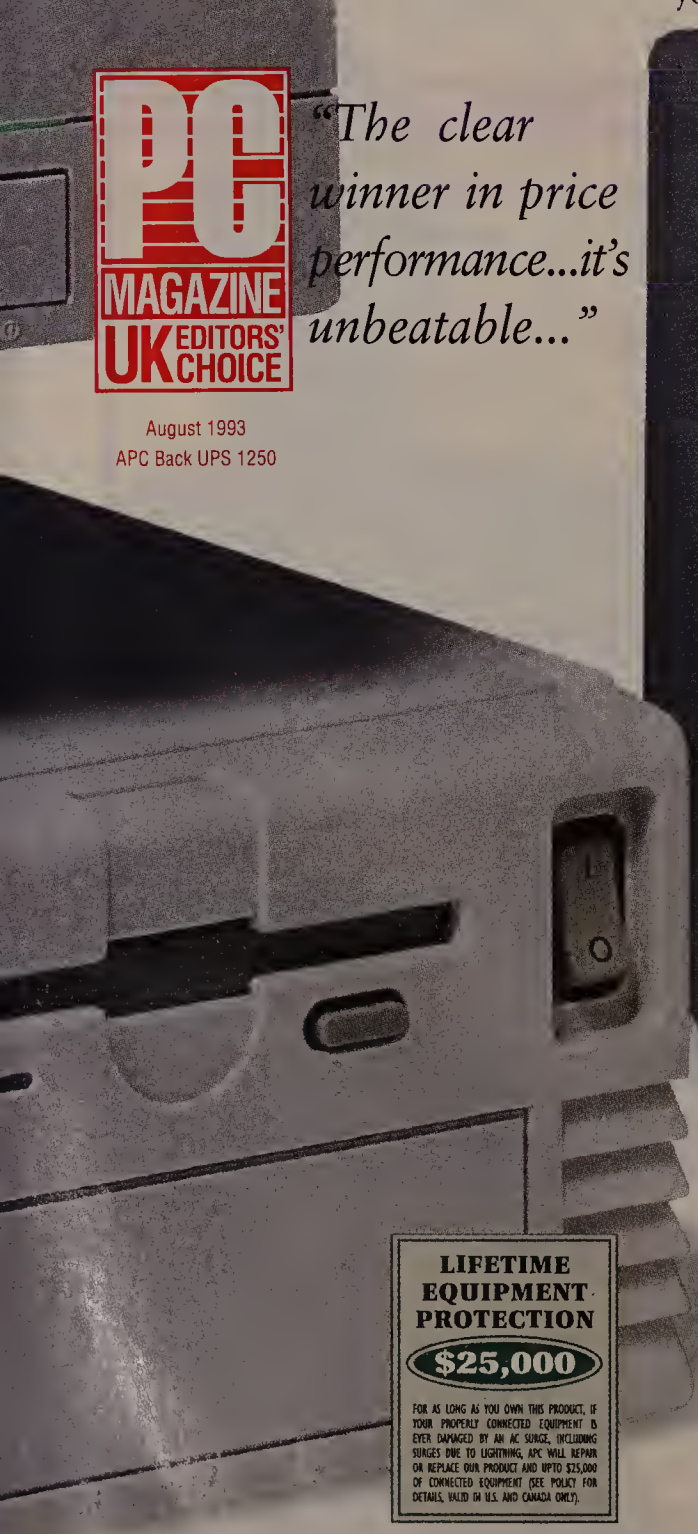
APC Voted most reliable by 3-to-1
Tripp
Best
PC MAGAZINE

In a recent poll by PC Magazine's *MagNet, APC was voted the most reliable UPS manufacturer by a 3-to-1 margin. That's dependability that will see you though years of unmatched power protection.*

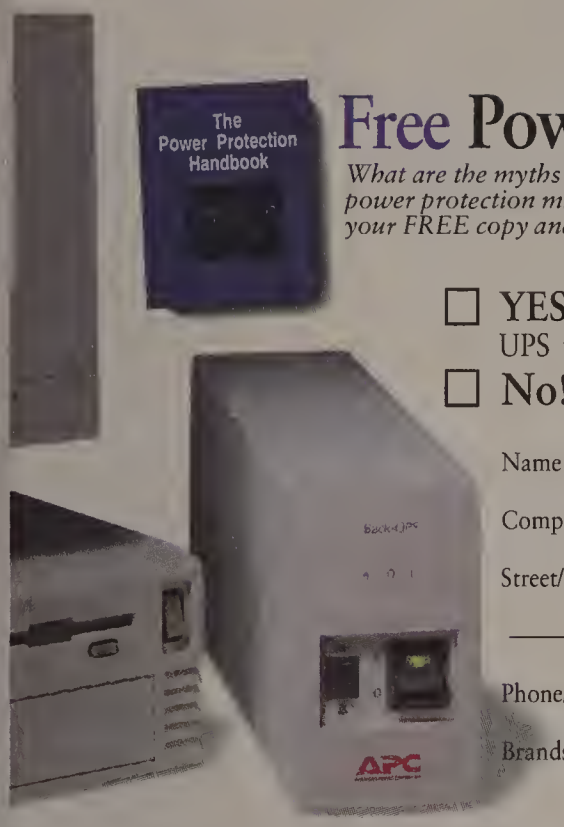
PC MAGAZINE UK EDITORS' CHOICE

"The clear winner in price performance...it's unbeatable..."

August 1993
APC Back UPS 1250



© 1994, APC. Back–UPS, PowerChute are trademarks of APC. Other trademarks are the property of their owners. Specs subject to change without notice.



Free Power Solutions Handbook

What are the myths and musts of PC protection? What are the 10 most common power protection mistakes? The top tips for adding reliability to your LAN? Get your FREE copy and find out!

☐ **YES!** I'm interested in trading up a competitive or older UPS to a Back-UPS. Please send Trade-UPS info.

☐ **No!** But I would like a FREE Handbook.

Name _____ Title: _____

Company _____

Street/City/State _____

_____

Phone/fax: _____

Brands of UPS used? _____ # servers/PCs to be protected? _____

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Phone _____

P3

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE

APC

AMERICAN POWER CONVERSION

132 Fairgrounds Road
P.O. Box 278
West Kingston, RI 02892-9920

Back-UPS® prevail

"All other brands of UPS die regularly in this lightning prone environment. My APC won't die!" said Paul Sisilli, Systems Analyst, City of Port St. Lucie . "With other brands, users don't find out until it is too late. The power interruptions here are very hard to live with. The other brands are dying off. Typically they last just beyond their warranty period. My Back-UPS is going on three years...no other brand is as reliable."

Don Traux knows first hand about Back-UPS reliability: "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house...my computer never blinked. Each morning I get a surge down the line and both APC's hate it - they simultaneously 'holler 'n clamp' while my 'Brand T' quietly sleeps in. I've relegated that unit to non-critical household stuff like my VCR."

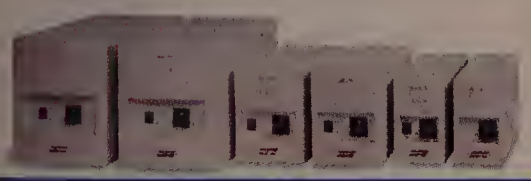
Andrew Wargo, Manager at Baxter Land Company, tried two other brands before Back-UPS. "One lasted a few days, a second one went up in smoke after 48 hours, a third lasted less than 24 hours! I then bought my Back-UPS for less than half of what I had paid for the others. We've purchased three more Back-UPS and for the past 14 months they've been just hummin' away on the same power line that was eating the other brands alive!"

virtually all separate surge suppressors. Surge performance is even backed by a $25,000 Lifetime Equipment Protection Guarantee.

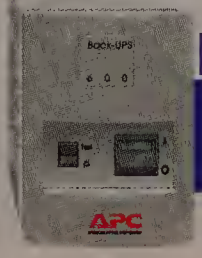
If you're protecting a network server, a communications interface port (on models Back-UPS 400 and higher) provides the security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

MADE IN

And since data processed on networked clients needs protection too, the $139 Back-UPS 250 provides an economical solution for all your LAN workstations.



Back-UPS (R to L)	Application	Sugg. List
250	LAN nodes, internet hardware, POS	$139
400	Desktop 486, 386 systems, servers	$229
450	Tower 486, 386 systems, servers	$279
600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799



More than... 1,000,000 Satisfied Users

APC has won more awards for performance and reliability than all other UPS vendors combined...including four consecutive LAN Times *Readers Choice awards...*

PC World Top 20 Upgrade

Windows Mag. Readers Choice

LAN TIMES READERS CHOICE 1990

Computer Reseller News Editors' Choice

Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how afforable it has become is easy...

Call today and find out (the easy way) why more than 1,000,000 satisfied users bank on Back-UPS from APC. With more awards than all other brands combined, field-proven reliability, and a two year warranty, Back-UPS are power protection you can purchase with confidence.

MICROSOFT WINDOWS COMPATIBLE

yes NetWare Tested and Approved

ARTISOFT COMPATIBLE LANtastic

SCO OK

Available and Ready for LAN Server

MICROSOFT LAN MANAGER VERSION 2.1 COMPATIBLE

Solaris COMPATIBLE

AWARD-WINNING FEATURES

Instantaneous backup power beats blackouts and brownouts

Unmatched lightning (tested to UL1449) and surge protection for maximum hardware safety

Network-grade line conditioning and EMI/RFI filters prevent glitches

LAN Interface (on Back-UPS 400 and up) provides automatic shutdown to all major OS: Windows, NT, NetWare, LAN Server, LAN Manager, LANtastic, Unix, OS/2, Vines, AppleShare/System7 and more.

Site diagnostics automatically spot missing ground and reversed polarity, two common miswirings which usually require an electrician's visit to diagnose.

Option switches allow you to customize transfer voltage and alarm settings.

Test Switch for ongoing peace of mind

2 year warranty and full safety approvals

$25,000 Lifetime Equipment Protection

APC™

AMERICAN POWER CONVERSION

PowerFax Info (800)347-FAXX

800-800-4APC

APC EUROPE (+33) 64625900 / ASIA/PACIFIC FAX: 401-789-1631 / L. AMERICA FAX: 401-789-9771 / Compuserve: GO APCSUPPORT
FOR GOVT/GSA SALES, CALL 1-800-788-5414

Dept. P3

Circle 45 on reader service card

It Walks, Talks ... And Listens!

Portable Computing With Built-In Business Audio.

No matter how hectic your pace, our 450 Colorscan stays with you every step of the way. It's light-weight, powerful, and packed with features, including complete business audio, dual scan display, PCMCIA slots, and optional mini-docking station. So whether you're on the road or in the office, you're in control!

Built-in business audio includes preloaded Audio Applications software, a microphone that, lets you anotate your work, speakers that enable you to present it, and the freedom to use external speakers and microphones if you choose. The dual scan display means your presentations will look as good as they sound. And PCMCIA makes adding additional peripherals a snap. Snap-in a mini-docking station and you can integrate your Colorscan into your office system with a single clip. So you're up and running the moment you sit down – on the road or at your desk!

450 Colorscan

- ❑ *Intel50MHz/486DX2 Processor*
- ❑ *4MB RAM Expands To 8MB Or 20MB*
- ❑ *250MB Hard Drive*
- ❑ *1.44MB 3.5" Floppy*
- ❑ *9.5" Dual Scan Passive Matrix Display*
- ❑ *Local Bus Video Controller With 512KB Video RAM*
- ❑ *Two Type 2.0 or One Type 3.0 PCMCIA Slots*
- ❑ *Built-In 19mm Trackball*
- ❑ *Built-In Business Audio. External Speaker and Microphone Jacks*
- ❑ *6.5 Pounds Including Battery*
- ❑ *84-Key Layout -Serial, Parallel Keyboard Ports And External Video*
- ❑ *MS DOS 6.2, Windows for Workgroups 3.11, Close-Up 4.0, AMIDiagLite, CompuServe Starter Kit*
- ❑ *Audio Applications Software*

Plug your 450 Colorscan into our optional mini-docking station ...Only $89.

RISK FREE GUARANTEE

- ❑ 30-Day Money-Back Guarantee
- ❑ 30-Day Price Protection
- ❑ One-Year Limited Warranty
- ❑ Out-of-Warranty Repairs
- ❑ Lifetime BBS Support
- ❑ Lifetime Technical Support
- ❑ Remote Rescue Online Support
- ❑ Environmentally Sensitive Packaging

$2,595
(Lease For $94/mo.)
450 Colorpro
$3,695
(Lease For $131/mo.)

To Order Or To Receive A Free Catalogue Call

1-800-333-3763

(7am - 7pm CST)

CompuAdd
CUSTOMER DRIVEN, BY DESIGN.

12303 Technology Boulevard
Austin, Texas 78727

MICROSOFT® WINDOWS™ READY-TO-RUN

yes NetWare Tested and Approved

intel inside

©CompuAdd Corporation 1994. Prices and specifications are subject to change without notice. CompuAdd is not liable for damage due to omissions or typographical errors. The Intel Inside logo is a registered trademark of Intel Corporation. All other brand and product names are trademarks or registered trademarks of their respective companies.

Circle 73 on reader service card

The Intelligent Person's Guide to Online Services

CompuServe. Prodigy. Delphi. MCI Mail. America Online. Nexis. Now, which online services have I forgotten? And how long has it been since I checked on my NewtonMail? Hope there isn't anything important sitting there.

Remembering—passwords, user IDs, how the interfaces work, what information is on which service, which service has the information for the lowest price—is a big part of being a cybernaut. You also have to remember to cancel the services when you're finally fed up with them or have settled on one you'd like to call home.

It's easier, of course, not to join the "wrong" service in the first place. Which is where I come in.

America Online You have to wonder why a service that has been so bogged down with new users would keep sending free sign-up kits and 10 hours of connect time to every person in the United States who might possibly own a computer. Nah. When you're a Wall Street darling, you have to keep stoking the fires, right?

AOL is, in some ways, like those people you only run into at cocktail parties: Pretty, great for casual conversation, occasionally charming, always friendly, but not the brightest person you'll encounter. And possessing quirks that, at first winning, are ultimately frustrating.

Still, AOL is an excellent service for newcomers and has online versions of many popular magazines, including this one. AOL has also recently added partial Internet access and news groups. It is not a bad place to have an electronic mail account on the Internet. On the other hand, the message boards are really clumsy, and the service was obviously designed to handle a far smaller number of users than it has today. • *America Online; 800/827-6364, 703/448-870. Reader service no. 801*

CompuServe is most of what an online service should be. Its scope is encyclopedic, from all the online technical support you're ever likely to need, to interest groups devoted to tropical fish, cooking, genealogy, and most anything else people do for love or money.

"CI$," as regulars call it, tends to be more expensive than other services. Don't even think of using the service without a copy of CIM or WinCIM, the CompuServe Information Manager program for DOS or Windows.

CIS lacks access to Internet services, aside from mail, but makes up for it by being so complete in itself. CIS is the best service available today. • *CompuServe; 800/848-8199, 614/457-0802. Reader service no. 802*

Delphi Internet Services, once a low-cost CompuServe wannabe, has recast itself as a low-cost Internet access service, at least during off-hours. If you need full access to the Internet and you don't mind a nongraphical interface, then Delphi might be the one for you. • *Delphi; 800/695-4005, 617/491-3342. Reader service no. 792*

Prodigy Take everything Sears knows about computers, add everything IBM knows about retailing, and you've created an online service that illustrates why its two owners fell upon hard times. Prodigy is reasonably inexpensive and comes with its own software, but otherwise I really can't think of a reason why you'd want it, unless you have compukids. With its mail monitors, Prodigy is probably the safest place to let kids play. (Prodigy users: Flame me at my AOL address: dcoursey@aol.com.) • *Prodigy; 800/776-3449. Reader service no. 804*

You may get the idea that many more bad services exist than good ones. But all the online services are dramatically improving their interfaces and lowering prices. It's more important to be online than to wait for the perfect service. I've been waiting for 14 years, and it still hasn't happened!

Contributing Editor David Coursey edits P.C. Letter. *He can be reached on PC World Online (see page 10 for more information).*

By David Coursey

LOOKING AHEAD

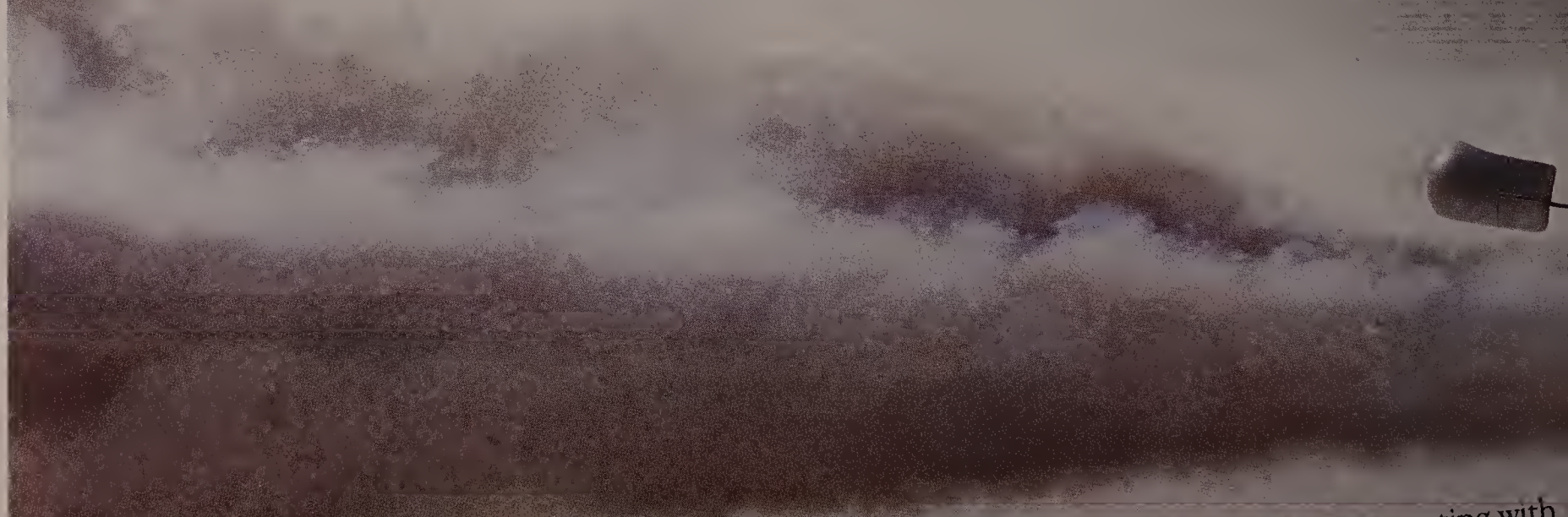
NVidia, a Silicon Valley start-up, says it's created a one-chip solution for GUI acceleration under Windows. The chip provides 3-D and 2-D video, wave-table audio, and game control, but doesn't require new software. The chip should start showing up in PCI-based machines next year, improving performance and simplifying system design...Have you played with Apple's digital camera? There's a Windows version, and it's really pretty cool if you have about $700 burning a hole in your pocket...When I'm missing a font, Elseware's FontWorks, about $79 on the street, creates it for me and gives useful advice on which fonts look good together...The new Peachtree small business accounting software for Windows, due about the time you read this, looks great...I wish I could say I had a good time at the Consumer Electronics Show in Chicago, but most of the software—including a Rush Limbaugh screen saver and the Penthouse Pets (they look better from a distance than up close)—makes me understand why some parents won't let their kids near a PC.

THE NEW PREMMIA™ GX. It merely starts with Intel's Pentium™ microprocessor, in two speeds, the fastest and very, very fast. In other words, 100 MHz or 90 MHz.

From there, AST engineers raised the bar, and the new Premmia screamed right by the Compaq Deskpro and HP Vectra to 112 million WinMarks* of graphics performance. With dual 100 MHz CPUs and the fastest cache system ever, just imagine what you could do.

You could actually do more than two things at once. That is what your boss has been asking for all along, right? Suppose, for instance, you are designing a suspension bridge. You could rework the center span drawings while

IT'S THE FASTEST PERSONAL COMPUTER THERE IS, GIVE OR TAKE A NANOSECOND.



intel inside

And less time fiddling with your computer setup. Whatever you're doing, security features will help protect your most sensitive data and corporate secrets. Who knows? You might be able to accomplish ten hours of number crunching in five, and catch an early commuter train home in time to see your Little Leaguer whack one out of the park.

Of course, the Premmia comes with expert backup, starting with a 3-year limited warranty.

Our network of over 6,000 resellers will help you with your purchase and stick with you afterwards, too. Every day, 24 hours a day,

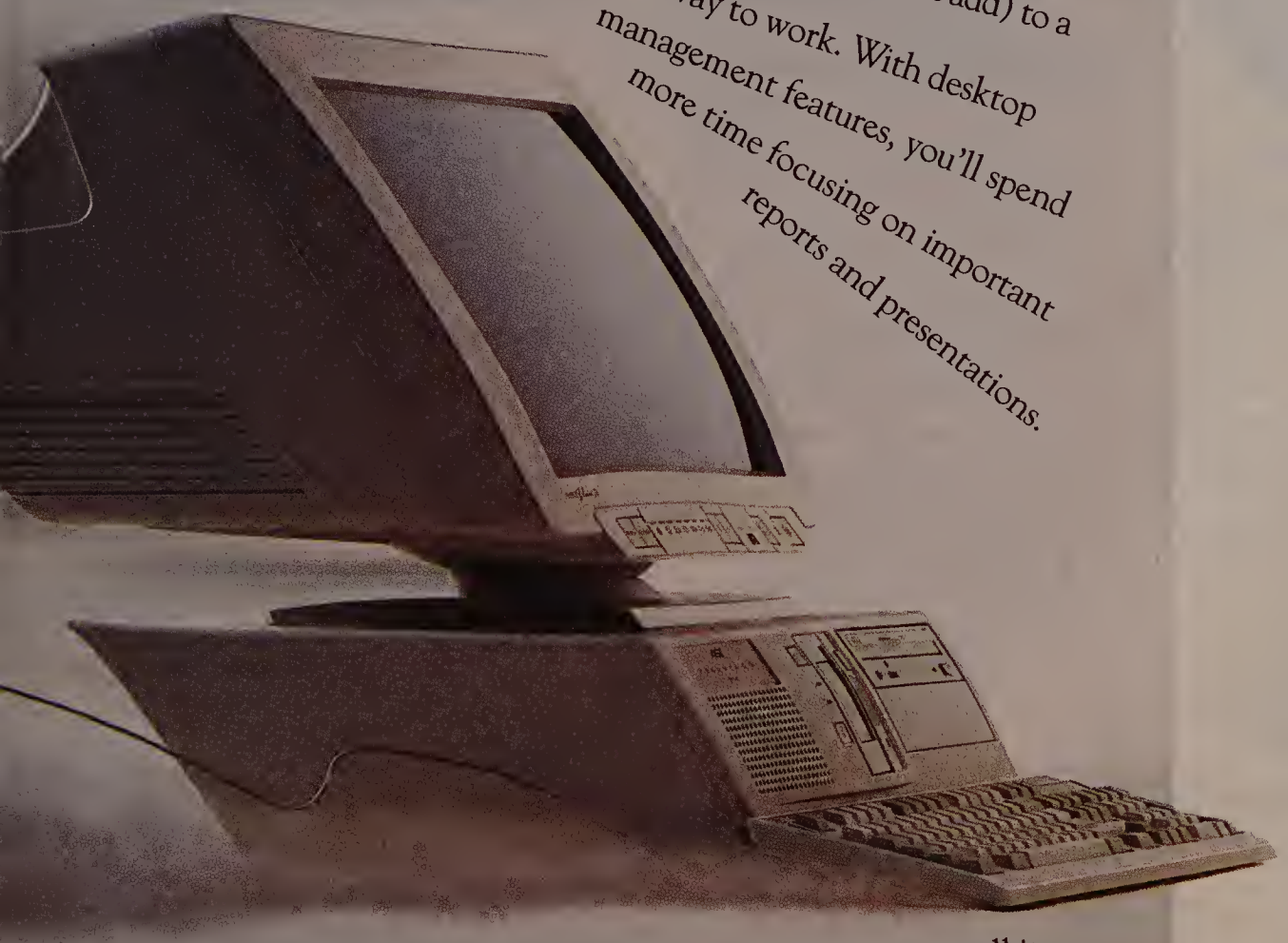
© 1994 AST Research, Inc. All rights reserved. AST is a registered trademark of AST Research, Inc. AST Computer, the AST logo, Premmia and "You'll Like the Way We Work" are trademarks of AST Research, Inc. The Intel trademarks or registered trademarks of their respective owners. *WinMarks 3.1 (4.0 score: 41 million). **CY93 unit volume shipments of AST and AST manufactured brands (International Data Corp.). The information included is

calculating load and stress numbers at the same time.

That's not all. The Premmia GX is affordable like a personal computer. But with a whole array of innovative features, it actually performs like a true workstation.

All the newest 32-bit operating systems are supported. Integrated Ethernet is already built right in. And there's no faster way to connect peripherals like a hard drive or a scanner than with the GX's integrated FastSCSI-2 controller.

Still, we're not simply talking speed for speed's sake. It all adds up (quite quickly, we might add) to a better way to work. With desktop management features, you'll spend more time focusing on important reports and presentations.



Premmia GX

Pentium 90 & 100 MHz, dual processor capable, OverDrive™ Ready. PCI and EISA. 256KB Synchronous Burst Mode cache. 64-bit PCI local bus graphics card. 2MB VRAM upgradable to 4MB. Supports up to 1280 x 1024 x 16.7 million colors non-interlaced. Integrated PCI local bus FastSCSI-2 controller. Integrated Ethernet. Type III PCMCIA capability. Plug-n-play capable. DMI support. Energy managed.

Premmia MX

Pentium 60 MHz, IntelDX4/100 and 486DX2/66, OverDrive Ready. PCI and ISA. Pentium models: 256KB cache. 486 models: 256KB cache on hard drive models, 64KB or 256KB options on base models. 64-bit PCI local bus graphics card. 2MB VRAM upgradable to 4MB. Supports up to 1280 x 1024 x 16.7 million colors non-interlaced. Type III PCMCIA capability. Plug-n-play capable. DMI support. Energy Star.

our own extra responsive telephone support group is here to help.

Would you expect anything less from the world's fifth largest personal computer manufacturer?**

Well, then, is this the kind of personal computer (or call it a workstation) you'd like on your desk?

In a blink. A snap. A flash. A heartbeat. A nanosecond. So why don't you hit speed dial and call us at 800-876-4AST.

YOU'LL LIKE THE WAY WE WORK™

AST® COMPUTER

nside logo is a registered trademark and OverDrive is a trademark of Intel Corporation. All other product or service names mentioned herein may be ccurate as of July 1, 1994, but is subject to change without notice.

At Prices Like Th
A Compaq Or You

Compaq Concerto

Now save several hundred dollars on the Compaq Concerto,™ quite simply one of the best notebook bargains around. The Concerto pairs the power of a 486 desktop with the convenience and portability of a quality notebook.

Now Only
$1,299
*Or $47 per month**

Concerto Features:

25MHz 486SL (DX) (33MHz available), 4MB RAM (upgradable to 20MB)
◈
120MB Hard Drive (250MB available)
◈
3.5" Diskette Drive
◈
9.5" Monochrome Backlit VGA Display
◈
Convenient Pointing Device
◈
Local Bus Graphics
◈
2 PCMCIA Type II slots (or single Type III)
◈
Preinstalled MS-DOS® 6, MS-Windows,™ PenPower for MS-Excel, InkWare NoteTaker, and TabWorks®

Compaq Contura Aero

Weighing in at a mere 3.5 lbs., the Contura® Aero™ is the perfect traveling companion. Though lightweight, it's packed with features, including a 486 processor that can run a range of applications with ease, as well as an integrated Compaq trackball that allows for comfortable use on the road.

$999
*Or $36 per month**

Aero Features:

Only 3.5 lbs. and 7.5" x 10.25" x 1.5"
◈
25MHz 486SX, 4MB RAM (upgradable to 12MB)
◈
84MB Hard Drive (170MB available)
◈
8" Monochrome Backlit VGA Display
◈
Integrated Compaq EasyPoint™ Trackball
◈
PCMCIA Type II slot
◈
NiMH Battery & AC Adapter
◈
Preinstalled MS-DOS 6, MS-Windows 3.1, and TabWorks

Compaq Contura

Monochrome
$1,799
*Or $65 per month**

Color
$2,099
*Or $75 per month**

An affordable notebook with the power and expandability for demanding business applications, and support for communications options. Power management features extend battery life, and security features protect data.

Contura® Features:

25MHz 486SL (DX), 4MB RAM (upgradable to 20MB)
◈
120MB Hard Drive (209MB available)
◈
3.5" Diskette Drive
◈
9.5" Monochrome VGA or 9.5" Color Advanced Passive VGA Display
◈
Compaq Trackball
◈
Battery & AC Adapter
◈
Only 6.2 lbs.
◈
Preinstalled MS-DOS 6, MS-Windows 3.1, and TabWorks

intel inside

*Leasing is provided by GE Capital Services for a term of 36 months and is subject to approved credit and certain terms and conditions. Call for details. †Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. Compaq Contura Aero and Concerto are covered by a 3-Year Pick-Up Warranty. © 1994 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. Contura is a registered trademark; DirectPlus is a registered service mark; Concerto, ProLinea, Aero, EasyPoint and EasyAccess are trademarks, and Solution Paq is a service mark of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks, and Windows is a trademark of Microsoft Corporation. TabWorks is a registered trademark of Xerox Corporation. The Intel Inside Logo is a registered trademark and Pentium is a trademark of Intel Corporation. Offer available in the U.S. only.

The Compaq 3-Year Warranty†

ESE, YOU CAN BUY CAN COMPROMISE.

Compaq ProLinea MT

MT 4/33s $1,725 *Or $62 per month**

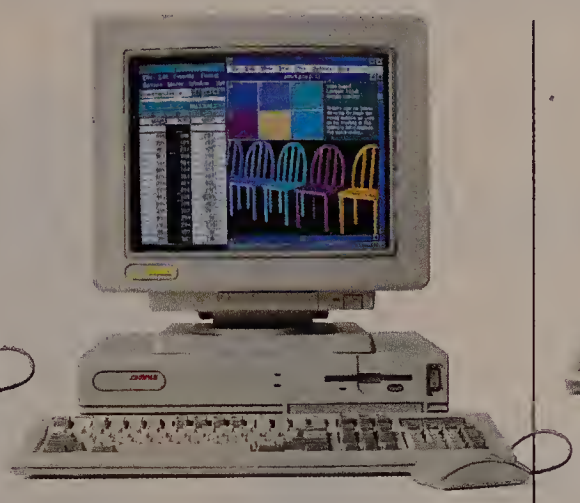
MT 4/66 $2,299 *Or $82 per month**

Minitower case with EasyAccess™ side panel has five expansion slots and five drive bays for superior expandability. Just add options like a fax modem, tape drive, or CD-ROM drive. Upgradable to Pentium™ technology.

ProLinea™ MT Features:

33MHz 486SX or 66MHz 486DX2
(upgradable to Pentium technology, ZIF socket)
◈
4MB RAM (upgradable to 64MB)
◈
340MB Hard Drive
◈
3.5" Diskette Drive
◈
Local Bus Graphics with 1MB
◈
14" SVGA Color Monitor (1024 x 768)
◈
Preinstalled MS-DOS 6,
MS-Windows 3.1, and TabWorks

Preinstalled Multimedia Solution Paq available.



Compaq ProLinea 4/33S

Enhanced performance with greater affordability. $1,475 *Or $53 per month**

Multimedia Solution Paq℠
With SoundBlaster 16-bit sound board, internal dual-speed CD-ROM drive, external stereo speakers, microphone & multimedia software. Starts at $499.

ProLinea 4/33S Features:

33MHz 486SX
(upgradable to Pentium Overdrive)
◈
4MB RAM (upgradable to 100MB)
◈
200MB Hard Drive
◈
3.5" Diskette Drive
◈
Local Bus Graphics with 1MB
◈
14" SVGA Color Monitor (1024 x 768)
◈
Preinstalled MS-DOS 6,
MS-Windows 3.1, and TabWorks.

Preinstalled Multimedia Solution Paq available.

Compaq ProLinea Net1/25s

An ideal choice if you're looking for excellent performance at an affordable price. $1,249 *Or $45 per month** The all-in-one styling saves desktop space and makes setup as simple as plugging the unit in. TabWorks, a Compaq exclusive, is preinstalled for greater ease of use. Network-ready and ideal for peer-to-peer communications.

ProLinea Net1/25s Features:

25MHz 486SX
(upgradable to 486DX2/66)
◈
4MB RAM (upgradable to 20MB)
◈
100MB Hard Drive
(200MB available)
◈
3.5" Diskette Drive
◈
Built-in 14" SVGA Color Monitor
(1024 x 768)
◈
Integrated Ethernet controller
(Token Ring available)
◈
Energy Star Compliant
◈
Preinstalled MS-DOS 6, choice of
MS-Windows 3.1 or MS-WFW 3.11

COMPAQ DirectPlus

The Compaq DirectPlus Catalog

1-800-888-5996

Weekdays 7-7, Sat. 10-4 CST

Ask for our new free catalog.

Circle 61 on reader service card

Management wants you to be more productive.

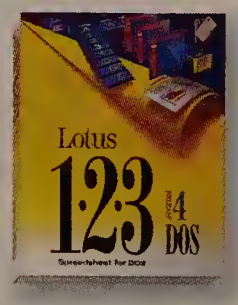
You don't want to change the way you work.

We have a new release of 1-2-3 for DOS.

This could work out nicely.

New release. New capabilities. Same great feeling.

The new 1-2-3® R4 for DOS has the productivity and ease-of-use features you've been asking for, without losing the comfortable feeling of the 1-2-3 you know and love. It does this without the expense of upgrading hardware or the time of retraining. And it's 100% compatible with all past 1-2-3 versions.



1-2-3 R4 for DOS incorporates user suggestions like Column Fit-Widest, a feature that automates column formatting to accommodate the biggest entry; a built-in

*$119 upgrade price direct from Lotus. Offer good while supplies last. **For volume purchase information, inquire about Lotus Passport. In Canada,
©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, 1-2-3, SmartIcons and Working Together

you can explore all kinds of scenarios, or work with all kinds of people on the same spreadsheet, without ever losing track of your thinking. 1-2-3 for DOS is also mail-enabled, so it's easy to share your work with anyone on your network.

The same 1-2-3 with great new features:

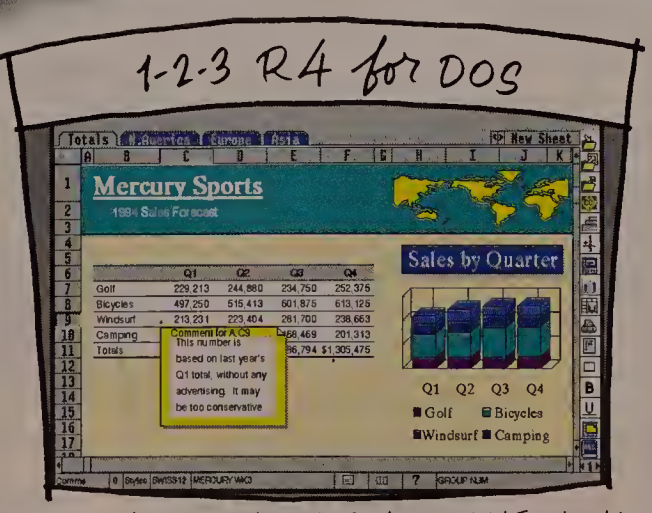
- Column Fit-Widest
- Spell Checker
- Auto BackUp
- Improved Help and Interactive Tutorial
- cc:Mail-Enabled
- Cell Notepad

As for ease of use, you get many of the graphical interface features that make our Windows™ products so popular – like a Live Status Bar for easy access to fonts, styles and other settings; Worksheet Tabs that make navigating between spreadsheets easy; and more SmartIcons® than ever, for one click access to the most crucial features.

spell checker; and a Cell Notepad that lets you attach a note to any cell on your spreadsheet.

It works better and it works easier.

1-2-3 R4 for DOS



The new 1-2-3 for DOS has Worksheet Tabs, a Cell Notepad, a Live Status Bar for easy access to settings and lots of SmartIcons.

And the new 1-2-3 for DOS includes the exclusive Lotus® Version Manager™ technology which allows you to keep track of different versions of data in a single file. This means that you can get all this without changing the way you work and most likely without upgrading your current hardware. Best of all, you can get it for just $119.*

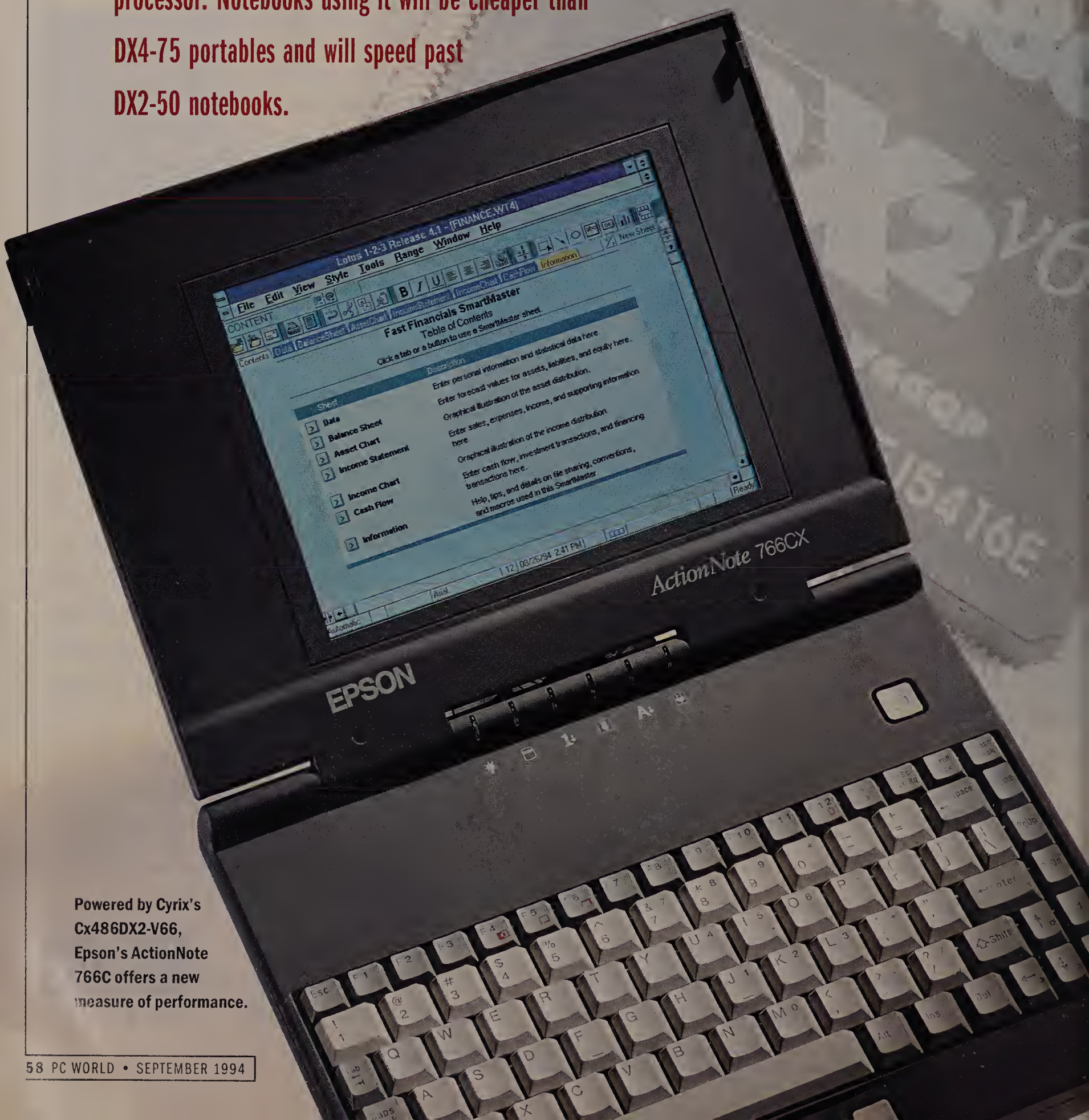
Just call us at **1-800-TRADE-UP, ext. 9934**** or visit your Lotus Authorized Reseller.†

Lotus
Working Together®

call **1-800-GO-LOTUS**. †If you are considering a move to Windows, our 1-2-3 Release 5 for Windows will have you up and running in no time.
are registered trademarks and Version Manager is a trademark of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation.

THE CYRIX ADVANTAGE:

Epson offers the first notebook to use Cyrix's Cx486DX2-V66 processor. Notebooks using it will be cheaper than DX4-75 portables and will speed past DX2-50 notebooks.



Powered by Cyrix's Cx486DX2-V66, Epson's ActionNote 766C offers a new measure of performance.

Edited by Russell Glitman

A BETTER DX2-66

TEST DRIVE

When it comes to notebooks, a DX2-50 is not so nifty anymore and DX4-75s have a new low-priced performer to contend with: Cyrix's Cx486DX2-V66 processor. While notebooks based on Intel's 50-MHz DX2 processor have provided some great deals this summer, systems powered by the new Cyrix chip promise better than DX2-50 performance and will cost much less than DX4-75s. The 3.3-volt Cx486DX2-V66 processor will debut this fall in notebooks that will be priced like DX2-50–based products but should run faster than Intel DX2-66 notebooks—by 10 percent or more, analysts say. Epson will be among the first vendors to ship notebooks using the new Cyrix processor, with systems due at the end of September. IBM Microelectronics is now making the chip for Cyrix, so there should be plenty of processors available for would-be vendors—potentially including IBM.

Cyrix's performance advantage is expected to arise from the chip's integrated cache. While the Intel DX2-66 includes 8K of write-through cache, the Cyrix processor can support 8K of either write-through or faster, more efficient write-back cache.

Write-Back Benefit

A preproduction Epson notebook we tested didn't have write-back cache implemented, although it will be in production models, and it also had only 4MB of RAM. While it slightly outran similarly configured DX2-50 systems, the Epson lagged on DOS application tests, probably because its PCMCIA drivers left only 512K of RAM free. The Epson will perform even better with the write-back cache implemented. *PC World* tests also indicate that simply adding 4MB of memory will improve Windows performance by 50 percent, which would position the Epson above the average for DX2-66 notebook performance.

Cyrix's new 66-MHz chip has two other advantages over Intel's DX2-66: a low price and a low-voltage design. In early July, Cyrix's chip was priced at $221 in volume to PC vendors, while Intel was charging $271. That can save vendors as much as $50,000 for every 1000 chips they buy from Cyrix instead of Intel. Another advantage: The Cyrix chip uses 3.3 volts, compared to the Intel's 5 volts, so it generates less heat and draws less power. As a result, notebook designers can opt for longer battery life, or can trim battery size and therefore notebook weight—the route Epson chose.

Epson Sets a New Standard

At 4.9 pounds, the Epson ActionNote 766C with a dual-scan color display weighs less than any 66-MHz notebook *PC World* has tested. "We see this Epson as almost a new category," says Mike McGuire, an industry analyst at market research firm Dataquest. "It's got all the features of a notebook but comes in almost at subnotebook weight."

To achieve a low subnotebook weight, manufacturers usually shrink screen or keyboard size, or make the floppy drive external. Not so with the 766 series of notes. The portables sport either a 9.5-inch dual-scan color screen or an 8.5-inch active-matrix screen. The units also include an internal floppy drive and an almost-full-size 85-key keyboard—hard to find on a subnote. A 12mm trackball sits below the <Space> bar.

The Epson ActionNote 766C has a street price of $2999 with 8MB of RAM (expandable to 20MB), a 260MB hard drive, and a dual-scan color display. Another dual-scan ActionNote offers 8MB of RAM and a 340MB drive for $3099. All the Epson hard drives are removable. Pricing is in the range of low-cost DX2-50 notes. For example, the Gateway ColorBook DX2-50 with 8MB of RAM, a 250MB hard drive, and a 10.3-inch dual-scan screen costs $2999.

News Monitor

NEW ON-RAMPS TO THE INFORMATION SUPERHIGHWAY: Cable, computer, and telecommunications companies are teaming up to test new technologies that could bring high-speed data networks—the conduits of the information superhighway—into your home. Here's a compilation of products and services under development.

Superfast Modems **Intel Corporation is working with General Instruments to develop high-speed cable modems. The devices connect a PC to your existing cable TV network, and they can transmit data hundreds of times faster than a conventional modem, which connects to a standard phone line. Trials are currently under way in the Philadelphia area. Intel expects cable modems to ship next year at "high-end modem prices," around $500 or less, says company spokesperson John Raftrey.**

Killer Apps **Faster may be better, but nobody needs a superfast modem for mundane tasks like reading sports scores online. Industry pundits see real-time video and graphics-intensive, interactive software as the killer apps for cable modems. In San Diego, Prodigy is testing a cable-based service (called Prodigy TV, naturally) that lets subscribers watch video clips without having to download huge files first. Subscribers can instantly view color photos that accompany news stories—a time-consuming chore with a 9600-bits-per-second modem. They can also view live video feeds from, say, ESPN and click an icon to read statistics**

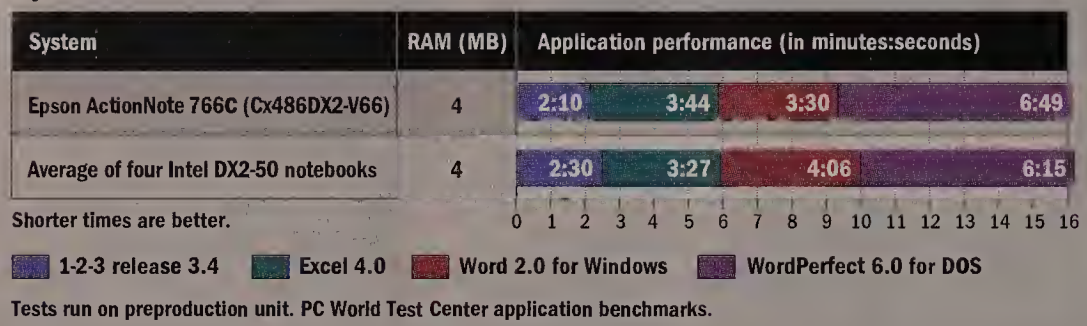
(continued on page 61)

PHOTOS: JOHN GREENLEIGH; ILLUSTRATION: PHILIPPE LARDY

Top of the News

TEST REPORT

Epson ActionNote 766C: DX2-50 Price but Better Performance



Tests run on preproduction unit. PC World Test Center application benchmarks.

With an 8.5-inch active-matrix display, the Epson ActionNote 766CX provides 8MB of RAM and a 260MB hard drive for $3399 and 8MB of RAM and a 340MB hard drive for $3499.

Using a NiMH battery, these notebooks should run for 3 to 5 hours, according to the vendor. The battery is hot swappable and recharges in 1.5 hours. The AC adapter weighs just under 6 ounces.

The ActionNotes include all the extras, such as local bus video with 512K of VRAM and Cirrus Logic's 5426 accelerator chip. Each unit has a PCMCIA Type II slot, a 14.4-kilobits-per-second fax-modem incorporated onto the motherboard, and Delrina's WinFax Lite software. Epson has bundled Borland's new personal information manager, Sidekick for Windows, and has preloaded both DOS and Windows along with their online documentation.

Epson provides an impressive three-year warranty, plus Extra Care Road Service, which guarantees a replacement notebook within 24 hours and Federal Express shipment of your notebook to and from Epson.

Bounty for Bargain Hunters

Analysts expect more machines using the 66-MHz Cyrix chip to ship this fall, at even more competitive prices. The Cx486DX2-V66 is hardly Cyrix's last hurrah. The Richardson, Texas, firm plans to ship a 3-volt 80-MHz 486 chip, the Cx486DX2-V80, for midrange desktop systems. According to Cyrix, these PCs will hit the street in October or November, priced about the same as Intel DX2-66–based systems. Cyrix claims this chip outperforms an Intel 486DX2-66 by up to 20 percent. The company says it's still on track to deliver a Pentium-compatible processor by year-end. IBM has an agreement to manufacture all these chips, as well as Pentium-compatible processors due early this fall from NexGen in Milpitas, California. Seems as though your selection of processors is only going to increase.

–Laurianne McLaughlin

Epson ActionNote 766 Series

First notebooks to use Cyrix's Cx486DX2-V66 weigh as little as 4.9 pounds.

Key Features: 9.5-inch dual-scan color or 8.5-inch active-matrix color display • Almost-full-size keyboard • Internal floppy • Local bus video

Pricing: $2999 to $3499

Availability: Immediate

Epson, 800/289-3776

Intel Slashes Pentium Prices:

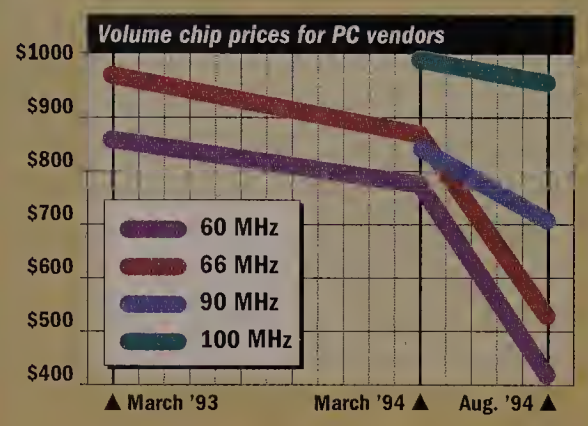
Life is tough at the front of the pack. Scrappy competitors such as Cyrix and AMD continue to nip at Intel's heels, introducing newer, faster 486 clones and promising cheap Pentium-compatible CPUs later this year. Meanwhile, industry giants IBM, Motorola, and Apple are promoting the PowerPC chip as the true Pentium-killer and have gone so far as to produce special effects–laden television advertisements that equate Intel's microprocessor with the long-extinct dinosaur.

What's the Tyrannosaurus rex of processors to do? The answer: make Pentium systems so affordable *no* buyer can afford to pass them up. Over the past year, the price that computer manufacturers pay for a 60-MHz Pentium chip has fallen from just under $900 to a little over $400, resulting in dramatic price reductions on Pentium-based PCs. Recently Dell Computer was the first major vendor to announce a fully configured Pentium system with 8MB of RAM, a 340MB hard drive, a 15-inch color monitor, DOS, and Windows for under $2000.

And the Pentium's desktop-only orientation will soon end. Intel plans to introduce a 75-MHz Pentium processor for notebooks, and Pentium-based portables should reach store shelves this fall, according to Intel officials. To support its Pentium push, Intel is rapidly increasing production of the chip: The Pentium will account for 25 percent of Intel's CPU shipments by the end of the year, the company says.

So is the 486 dead? Not quite yet, say industry pundits. With Cyrix and AMD at the 486 party, buyers should find excellent prices on systems that are fast enough for standard business applications such as word processing and spreadsheets. But if your company is making the leap to processor-intensive tasks such as video conferencing, the Pentium (or one of its speedy competitors) is the better bet.

Pentium Prices Plummet

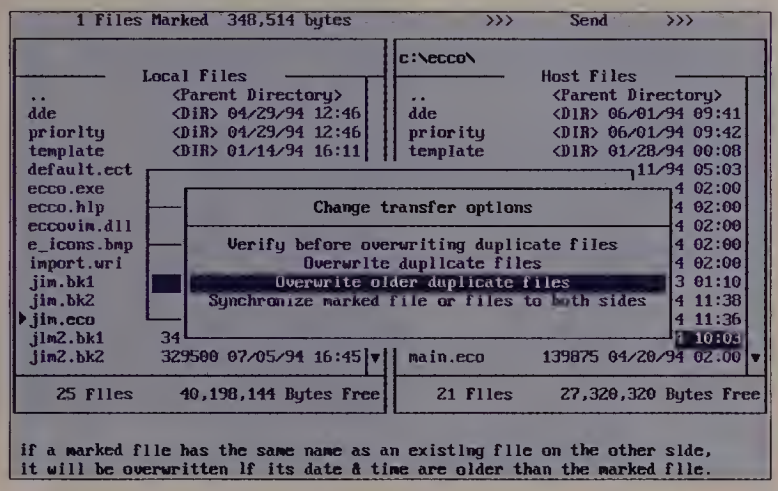


Source: Intel Corp.

Close-Up Telecommuting

TEST DRIVE I recently moved to Vancouver, Washington. It's a long commute to *PC World*'s San Francisco offices, where I'm publisher of online services. Nonetheless, to be effective I must stay in touch with my colleagues and the people who report to me.

Flying back and forth every day was out of the question, and spending the entire work week away from my home and family was too unpleasant to contemplate. The compromise solution: Two days a week I telecommute to work using Norton-Lambert's Close-Up 6.0, a speedy and well-behaved remote control program. Close-Up has made both my work life and my family life a lot simpler. The new version is faster than its predecessor and sports new transfer options including my favorite: the capability to synchronize, or *mirror*, files.



FILE SYNCHRONIZATION is made easy with Close-Up's Mirror facility, which lets you rapidly update files on two systems.

I start my long-distance workday by reading my E-mail and answering voice mail remotely. (My San Francisco office phone calls are forwarded to my home office telephone when I'm in Vancouver.) Then I fire up Close-Up and use its Remote feature to log on to my computer at *PC World* (which uses the Host part of Close-Up.) The program's automatic call-back feature prevents anyone but me from accessing my computer: Close-Up reads my password, hangs up the phone, then dials my computer in Vancouver, using the telephone number associated with that password.

Once Close-Up connects, I log on to the *PC World* network just as if I were sitting in my office—in fact Close-Up is so fast, I sometimes forget I'm working from home. Using Close-Up I can "chat" with colleagues interactively (as long as they're running a copy of the program) and check my personal information manager (PIM) for meeting requests and changes in my schedule. A 10-to-20-minute connect time in the morning usually sets me up for the day. In the evening I update both computers by using Close-Up to call again and mirror essential directories.

Using the program's built-in file-transfer software, I can mirror two directories, bringing both of them up-to-date with any additions or deletions.

Close-Up installs like a dream: It finds your modem and the COM port the modem's using, warns you of any potential conflicts, then installs itself without a hitch—just specify your modem model (Close-Up supports over 650).

Easy to use, fast, and full-featured, Close-Up 6.0 makes telecommuting better than being there. My thanks—and those of my wife and family—to Norton-Lambert.

—Jim Moody

Close-Up 6.0

Operate your office PC from a mobile or home office system.

Key Features: File synchronization

- Zippy performance

Pricing: Host and Remote $199

Availability: Immediate

Norton-Lambert, 805/964-6767 ext. 1

Reader service no. 810

News Monitor

(continued from page 59)

about a certain team or athlete. America Online and CompuServe are developing similar services.

High-Speed Phone Lines Motorola is designing its CableComm service to boost the throughput of cable networks for high-speed voice and data services, including video teleconferencing. CableComm will offer two-way communications services over cable at transmission speeds up to 384 kilobits per second, according to Motorola. CableComm subscribers will be able to make phone calls via the cable network, and tap into online services at much higher transmission speeds than those offered by analog phone lines or high-speed digital services like ISDN. Market trials are slated to begin in the middle of next year, with customer shipments starting in late 1995.

A LAN in the Home Microsoft Corporation is working with California utilities provider Pacific, Gas & Electric and the TCI cable network to provide energy management services to consumers. Due to be tested in Walnut Creek, California, the service utilizes a TCI set-top TV box with Microsoft-developed software. It creates a mini-network capable of transmitting data across a house's existing electrical wiring—useful for, say, using your office PC to turn on your air conditioner before you head home. According to Microsoft, testing will continue through 1996.

(continued on page 63)

How to Make Your PC Listen

I have been talking to my computer for years—mostly saying things you can't print in a family magazine—and, frankly, I've been a little disappointed by the lack of response. But now that there's Kurzweil Voice, my PC can finally listen to me—even if it's still a little hard of hearing.

Unlike low-cost sound board utilities, which let you bark out simple commands to launch applications and shuffle files, Kurzweil Voice 1.0 for Windows is a full-fledged keyboard replacement: Simply open your word processor or spreadsheet and start dictating. An accomplished "dictator" could enter 40 to 50 words a minute—faster than many people type.

In the past, such speech recognition systems were hard to use and cost thousands of dollars, which limited their use to disabled people and those in specialized fields such as medicine. But Kurzweil Voice's slick Windows interface and $995 price place voice input within reach of business users.

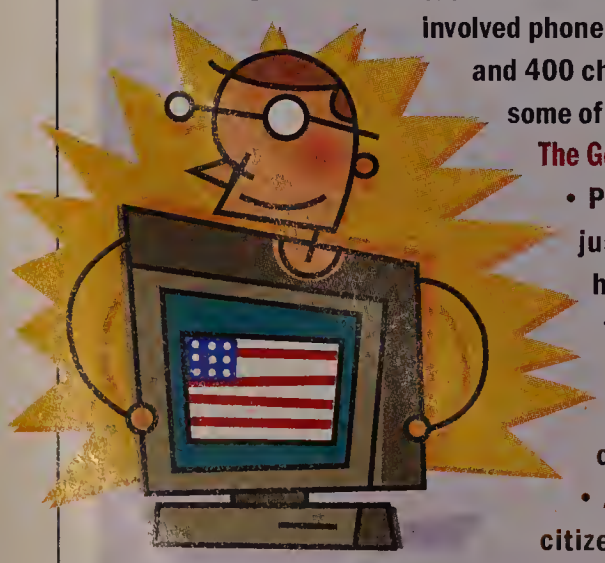
The implications of voice technology are enormous. Besides making PCs accessible to people who can't type, voice input could eventually make keyboards a thing of the past—and enable computers to become far more portable. Unfortunately, to use voice input today, you'll need to learn an entirely new way of working with your computer. For the average user, the effort may not be worth the aggravation involved.

Look, Ma, No Hands

Like its competitors—IBM's Personal Dictation System for OS/2 and Dragon Systems' Dragon Dictate for Windows—Kurzweil Voice gradually "learns" your voice, becoming more accurate over time. Unlike the IBM and Dragon systems, Kurzweil doesn't require hours of training before you can use it; you simply install the software and the voice-processing board, plug in the headset microphone, and begin talking. (However, you'll get better results if you "enroll" your voice by reading a list of 400 words; this takes about 15 minutes, plus another 90 minutes or so for Kurzweil to process the data.)

Survey of Americans and Technology:

Technophiles are hip, and they constitute a majority in the United States today, according to "Technology in the American Household," a survey the Times Mirror Center for the People and the Press conducted that studied how Americans are using electronic technologies. The survey, performed in January and February 1994, involved phone interviews with 3667 adults and 400 children nationwide. Here are some of the specific findings:



The Good:

- **PC users aren't geeks; they're just as likely as nonusers to have an active social life and to participate in sports, and they're more likely to describe themselves as having outgoing personalities.**
- **A majority of United States citizens describe themselves as technophiles. By a margin of 65 percent to 30 percent, Americans like rather than dislike computers and technology.**
- **Computers are empowering. PCs give us more control over our lives, say 42 percent of those surveyed.**
- **Computers let us work at home. Of regular PC users, 67 percent work at home occasionally.**

The Bad:

- **Not everyone can ride on the information superhighway. Only 12 percent of households have a PC with a modem.**
- **Not all children have the same access to technology. Among college graduates with children, 49 percent say that their children use a PC at home, compared with 17 percent of parents with only a high school diploma.**

The Ugly:

- **Some people think the PC is a friend of Big Brother. A whopping 55 percent of Americans think computers are being used to invade their privacy.**
- **Americans still spend more time watching TV than engaging in any other leisure activity.**

But make sure you're packing some serious hardware: Kurzweil Voice requires a 486-33 or better system with at least 16MB of RAM and 30MB of disk space. And be prepared to spend some quality time with the manual and online tutorial—mastering Kurzweil's dictation techniques is almost like learning a new language.

For example: To control applications, you recite specific groups of words, such as *file-open* or *enter-key*. At times the syntax gets pretty obscure (*auto-caps-on*?). Fortunately, Kurzweil provides a scrollable list of voice commands for each of the 20 major Windows apps it supports. (You can also assign voice commands to other Windows programs using the Kurzweil Command Editor.)

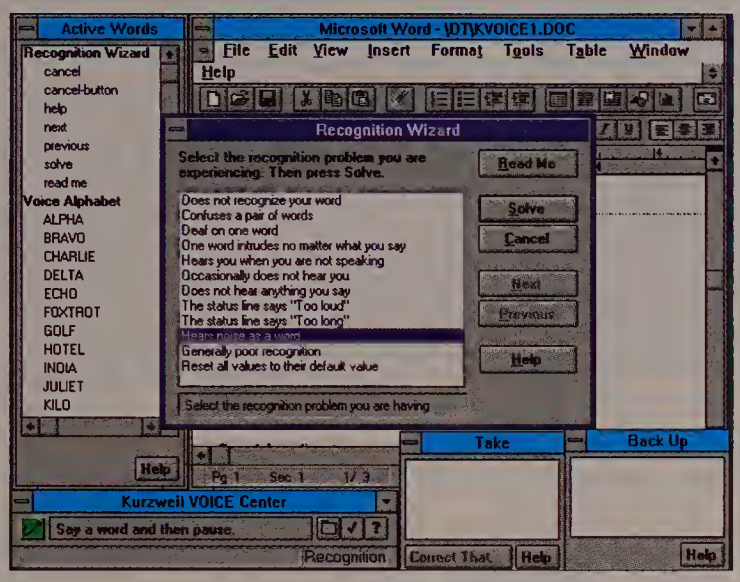
Dictating text is more complicated: You must pause... between...each...word. As you speak, Kurzweil inserts the word that it thinks you said into your document, then shows you the four closest alternative words. You can accept the new word by continuing with your dictation, or choose one of the alternatives.

If the word you want isn't listed, you have to stop dictating and correct it. You can use voice commands to correct up to the last 10 words you spoke, which allows the program to fine-tune its profile of your voice and lets you add words to Kurzweil's 40,000-word base vocabulary. You can also use the keyboard to correct errors, but then the program won't learn from its mistakes.

Speech Impediments

Kurzweil flubs words quite often, especially when you first use it. For example, it interpreted the phrase *This memo was created with Kurzweil Voice* as *This memo was defeated with curse while boys*. The program also tends to interpret background noises (such as a barking dog) as words. However, you can use Kurzweil's Recognition Wizard correction feature to solve most nagging problems, and errors tend to diminish the more you use the program.

On the other hand, navigating documents and dialog boxes using voice commands such as *up-arrow* and *tab-key* is extremely tedious. For example, I wrote this story using Kurzweil Voice, but I had to resort to the mouse to move around, and dictating took much longer than typing.



KURZWEIL VOICE'S RECOGNITION WIZARD lets you tune out background noises to increase the program's accuracy.

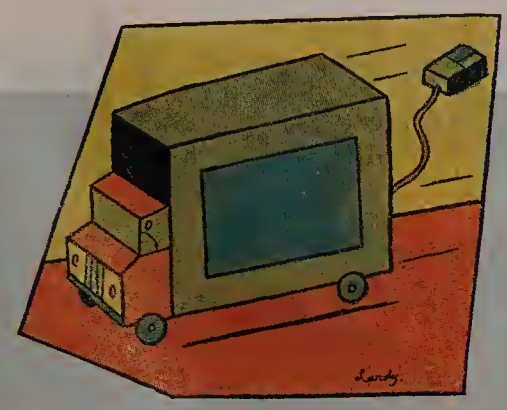
There are two competing products worth considering. Dragon Dictate for Windows is the only dictation product that works with 16-bit sound cards. A version with a 30,000 vocabulary sells for $695. IBM's Personal Dictation System has a base vocabulary of 32,000 words and is available only for OS/2. It costs $998. A Windows version is coming in the fall.

If you have to choose between working with voice and not working at all, Kurzweil Voice may be the answer, especially if you can use it alongside traditional input devices. Otherwise, you'll need to put in a lot of time and effort before you and your PC are on speaking terms.

—Daniel Tynan

Kurzweil Voice 1.0 for Windows

Affordable voice recognition system.
Key Features: Recognition Wizard • Speaker independent • Support for 20 major Windows applications • 40,000-word base vocabulary
Pricing: $995
Availability: Immediate
Kurzweil Applied Intelligence, 800/380-1234
Reader service no. 811



News Monitor

(continued from page 61)

LONG HAUL TO CHICAGO: It may be a longer trip to Windows 4.0 than you think. Microsoft's upcoming 32-bit operating system, code-named Chicago, will ship by the end of 1994, the vendor says. But information systems managers in medium to large corporations plan to wait 4 to 12 months after Windows 4.0 ships before upgrading, according to a poll of 400 managers by International Data Corporation (IDC). "There's a great deal of reluctance to accept it right out of the chute," says Mary Conti Loffredo, research manager at IDC. Managers worry that the first version of Chicago will ship with bugs, she says.

LARGE-SCREEN, SMALL-FOOTPRINT MONITORS: Next year, IBM will introduce a dramatically different small-footprint computer display, only 4 inches deep. An application of technology invented for NASA's space shuttle program, the new monitors will be available in screen sizes up to 20 inches and will weigh about one-fourth as much as existing products. Dave Himes, brand manager for IBM's Visual Products group, says the products will compete at the high end of the market and will work with any graphics subsystem. IBM would not disclose prices or describe the monitors' technology. IBM plans to preview the monitors at the fall Comdex in Las Vegas and offer 17- and 20-inch versions for sale in 1995.

Edited by Randy Ross
Contributors: Joe Abernathy, Jeff Bertolucci, and Laurianne McLaughlin

Making the Best of Peer Connections

TEST DRIVE

Everyone is doing it. Getting connected. Networking. And the marketing messages are so seductive:

"Finally, networking is simple for small groups."

"This is the fastest network you can buy off the shelf. It's also the easiest to install."

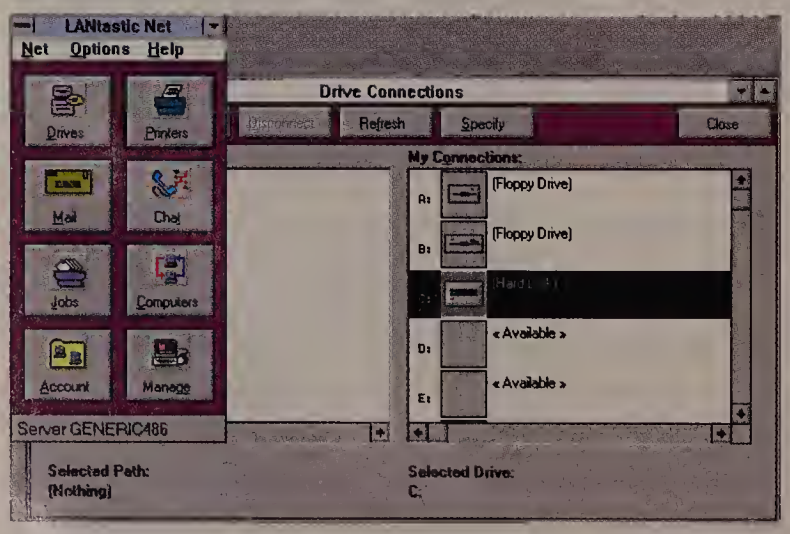
Already 51 percent of the PCs used by business, education, and government in North America are connected to a local area network, or LAN, according to Marty Palka, principal networking analyst with the Dataquest research firm in San Jose, California. That number is expected to grow to 85 percent by 1998. However, most of these LANs are seething snake pits of cables and hydra-headed servers that require network acolytes to install and service them.

NETWORKING IN HIS OFFICE: Surrounded by a plethora of peer networks, Senior Editor Joe Abernathy finds that making the right connections can be frustrating.

Networking by the People, for the People

In contrast, peer-to-peer networks are far simpler and cheaper—and paradoxically less broadly used. Only about 27 percent of small office/home office sites—the primary domain of peer LANs—have networks, according to Palka. Yet a peer network offers many of the advantages of a server-based LAN: Every computer can share resources such as files, schedules, and printers, and you can run electronic mail and work-group software. Because peer nets are less complex than server-based LANs, they are ideal for proprietors of small to medium-size businesses or for departmental managers in larger firms. In addition, you don't need to hire a systems administrator.

And the truth behind the marketing hype? Well, peer networks have some disadvantages compared with server-based LANs. Know that the more systems you connect on a peer network, the worse the performance; heavy LAN usage can bring an office to a standstill. With a server, a dedicated high-performance PC handles the network activity. Another hitch: You can't always connect PCs over the distance you can with server-based LANs; in some cases the maximum is 200 feet. You may also be restricted to connecting as few as 30 PCs. Server LANs can accommodate thousands of users and can cover a much wider area.



ARTISOFT'S LANTASTIC is the most expandable, easy-to-install peer network—though linking to NetWare proved a bear.

Why install a peer-to-peer network? Why install any network? Time and money. With a network, you can share resources such as database files and printers. Users will also benefit from E-mail, centralized backup, the ability to harness work-group applications, and with certain networks, the ability to access external resources such as the Internet.

How We Did This to Ourselves

We wanted a real-life office experience, so we set up a test-bed made up of six PCs and two notebook computers: The PCs consisted of an IBM clone running a Cyrix 386-25 to 486-50 upgrade chip, a Gateway 2000 486-66, a Zeos Pantera 66-MHz Pentium, a DECpc LPx 566 Pentium, a Compaq XL 60-MHz Pentium, and a Dell OmniPlex 486/100.

Only the Zeos and Compaq included adapter cards, so we laid in a stock of popular cards ranging in price from $50 to $200: Novell's NE2000 Ethernet, 3Com's EtherLink III, and Intel's EtherExpress 16. To tie in notebooks from Texas Instruments and Compaq, we used the 3Com EtherLink III PCMCIA adapter and a Xircom CreditCard Ethernet CE-10B2 adapter.

DAN FORD CONOLLY

8 hours of
battery life.
Yes, you read it
right: 8 hours.

DELL® LATITUDE™ XP
INTEL® DX4™ 75MHz SYSTEM

$3399

BUSINESS LEASE◊: $126/MO.

- 9.5" DUAL SCAN STN COLOR
- 8MB RAM
- 340MB HARD DRIVE
- 3-YEAR WARRANTY†
- NEW LITHIUM ION BATTERY

ORDER CODE #600011

DELL™

To Order, Call

800-284-1160

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11DDE

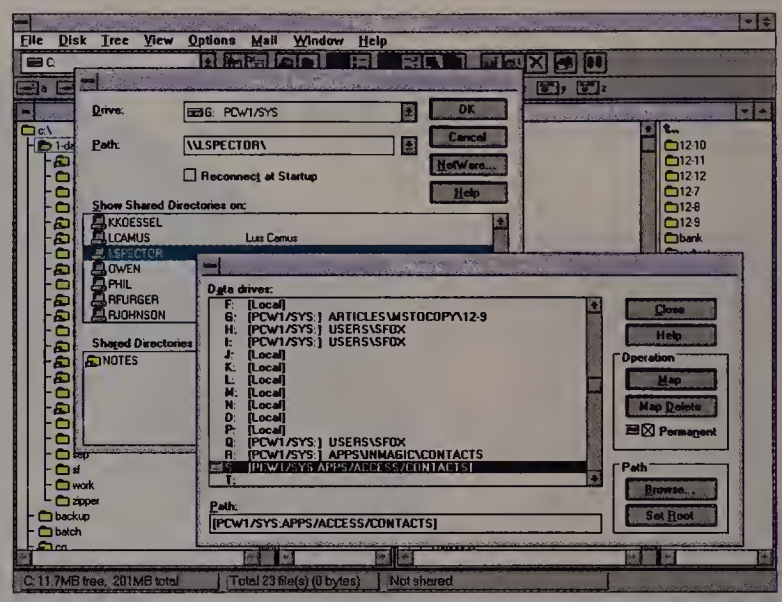
Continued from page 64

Only Coactive Connector and Simply LANtastic include cabling (owing to their proprietary nature, they must provide their own cabling), so we ran to the store and bought a supply of 10Base2 (thinnet) coaxial cables, terminators, and T-connectors. (Twisted pair, or 10BaseT, is generally used only in larger, server-based networks. 10Base2 lets you run a maximum of 800 feet of cabling, although you can buy repeaters to increase the reach. The proprietary Simply LANtastic, on the other hand, reaches only 200 feet.) Plan on spending $10 to $15 per PC.

The internal network adapters from 3Com and Intel installed without difficulty—we used a simple software-based setup procedure instead of having to set jumpers or dip switches. The jumper-based NE2000 adapters were a headache and didn't work in the Gateway, Cyrix, and DEC PCs.

Microsoft Windows for Workgroups 3.11

Much as we hate to admit it, we found that in an all-Windows network, nothing beats Microsoft's Windows for Workgroups 3.11 for working with any other DOS or Windows installation, including beta versions of Windows 4.0 (Chicago) and Windows NT 3.5 (dubbed Daytona). Less positive was our experience in trying to configure Windows for Workgroups. While it automatically detected the network adapter on many of our test machines, other systems using the Novell NE2000 Ethernet adapter locked up until we downloaded a new driver from the Microsoft bulletin board (call 206/936-6735). Also, we found that Windows would lock up while loading if the network was not properly terminated; if you don't have a cable hooked up to the NE2000 card, then you will need to attach two terminators to the T-connector.



CONFIGURATION HASSLES dogged our installation of Windows for Workgroups, though it excels at Windows connectivity.

Windows for Workgroups is the only product here to support protected-mode Microsoft NDIS 3.0, the latest Microsoft network driver spec, which requires only 4K of conventional memory and runs faster than real-mode NDIS 2.0 drivers. Most popular network adapters are supported through bundled NDIS drivers; installing third-party drivers is usually a snap. Windows for Workgroups also works with Novell IPX and ODI drivers, allowing tight integration with Novell NetWare servers. Compatibility with TCP/IP (Transmission Control Protocol/Internet Protocol), the lingua franca of the Internet, is available as an add-on. Connectivity with Windows NT and the Workgroup Add-On for MS-DOS—which adds workstation and server capabilities to DOS machines—is excellent.

Microsoft Windows NT 3.5

Windows NT? Not Today. Not Tomorrow. Nice Try. No Thanks.

You've heard the jibes from competitors. But that was then, and this is now.

NT: New Technology. We're ready to concede that this version of Windows rocks like no other—even after spending four days treating a hard drive cancer caused by a bug in the file system of the 3.5 beta version of NT. It's faster than release 3.1 and supports high-end features such as preemptive multitasking, crash protection, and multiprocessors. Unlike 3.11, NT uses its own drivers and works with most popular adapters.

It offers networking that's compatible with Windows for Workgroups and supports a wide variety of non-Microsoft protocols, including IPX and TCP/IP, making it possible to connect to just about anything on your network—or external to your network, such as the Internet. If your business grows, you can expand

Road Map to Choosing a Network

Are you networking a small office or home office?

- Do you need to share files or printers among Macintoshes and PCs? → Coactive Connector
- Do you want to avoid opening your PC? → Coactive Connector
- Do you want ethernet speed without the hassle? → Simply LANtastic starter kit
- Do you need ethernet? → Windows for Workgroups, Windows NT, Workgroup Add-On for MS-DOS; Intel EtherExpress or 3Com EtherLink III adapter

Are you building a new network for a medium-size office or work group?

- Will you be connecting only DOS and Windows PCs? → Windows for Workgroups, Windows NT, Workgroup Add-On for MS-DOS; Intel EtherExpress or 3Com EtherLink III adapter
- Will you need to share files or printers among Macintoshes and PCs? → LANtastic with LANtastic for Macintosh
- Will you need connectivity with UNIX or proprietary workstations? → LANtastic with LANtastic for TCP/IP

Are you adding peer-to-peer capabilities to a server-based LAN?

- Are all workstations running Windows? → Windows for Workgroups or Windows NT
- Are some workstations running DOS? → LANtastic or Novell Personal NetWare

7 day a week, 24 hour a day hotline dedicated to notebook support, and nothing but notebook support.

DELL LATITUDE
INTEL SX 33MHz SYSTEM

$1999

BUSINESS LEASE: $74/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 200MB HARD DRIVE
- $99 SECOND BATTERY (REQUIRED FOR 8 HOURS OF POWER)*
- 1-YEAR WARRANTY†

ORDER CODE #600009

DELL™

To Order, Call

800-284-1160

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11DDF

Continued from page 66

to a server-based LAN with Windows NT Advanced Server. This scheme also provides Macintosh connectivity and a variety of other enhancements. NT still requires 12MB of RAM, although we strongly recommend 16MB.

NT was fairly easy to bring online, but the hours I spent on the telephone with Microsoft's software engineers were not enough to establish a connection to the Internet using PPP (Point to Point Protocol) and TCP/IP. However, when it comes to performance, NT is what Windows 3.1 should have been.

Performance Technology Powerlan 3.0

Powerlan is a powerful peer-to-peer networking package with a few shortcomings. It provides full support for both DOS and Windows, and its DOS memory requirements (up to 76K) are acceptable.

The documentation is weak, however, and if you venture beyond Performance Technology's proprietary adapter drivers, installation becomes a challenge. While it is possible to integrate Powerlan with Microsoft networks, such as Windows for Workgroups and Windows NT, most people will need assistance to make this work. Powerlan cannot browse resources on Microsoft networks, so in order to interact with devices on the net, you have to know the name of the machine or the printer you want to use.

The key installation trip wire we found also affected the installation of LANtastic 6.0: To get the LAN up and running, you have to load MSCDEX, Microsoft's CD ROM driver, after loading the network drivers—not an intuitive act.

Artisoft LANtastic 6.0

LANtastic 6.0 is without question the most expandable peer-to-peer network available for PCs. It includes DOS and Windows-based utilities and provides better integration with Novell NetWare than any product we looked at, including NT. Separate packages allow you to hook into TCP/IP networks and Macintosh systems.

It's easy to get LANtastic up and running when you use a network adapter supported by Artisoft. But when using an NDIS or ODI driver (which is required for interaction with Windows for Workgroups or NetWare), it is not nearly as easy as the marketing fluff on the back of the box makes it sound. We spent several hours on the phone with Artisoft's technical support department trying to get these drivers to install properly. On the positive side, though, LANtastic requires just an 80K driver to run.

Like Powerlan, LANtastic cannot browse resources on Microsoft networks, and you have to change the order in which MSCDEX loads in your AUTOEXEC.BAT. (By the way, we found that to share a CD ROM drive on any LAN, you must type **/S** on the MSCDEX command line in your AUTOEXEC.BAT file.)

Artisoft provides an upgrade path for growing your peer-to-peer network into a server-based LAN, or for operating one in parallel in a large company, via its CorStream Server product. CorStream is essentially a version of Novell NetWare 4.01 capable of working seamlessly with LANtastic 5.0 and 6.0 clients. This compatibility makes it possible for you to add a server to the peer network without disturbing the workstations. Artisoft also offers separate LANtastic for TCP/IP and LANtastic for Macintosh products.

LANtastic is flexible enough to network

A Who's Who of Peer Networking

Coactive Connector 2.0
Price for 2 nodes: $399.95
Coactive Computing, 800/727-4273, 415/802-1080
Reader service no. 782

LANtastic 6.0
Price for 2 nodes: $459

Simply LANtastic 5.1
Price for 2 nodes: $299
Artisoft, 800/233-5564
Reader service no. 783

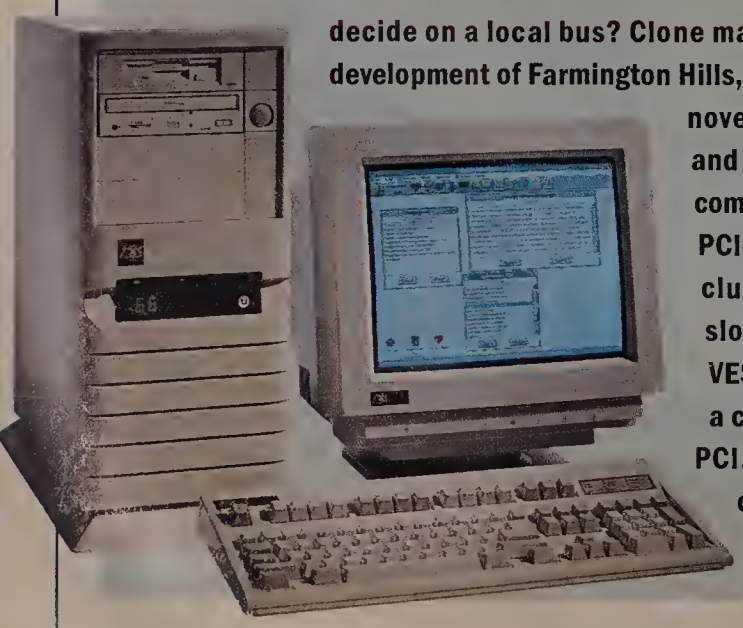
Personal NetWare 1.0
Price for 2 nodes: $198
Novell, 800/638-9273
Reader service no. 784

Powerlan 3.0
Price for 2 nodes: $198
Performance Technology, 800/327-8526
Reader service no. 785

Windows for Workgroups 3.11
Price for 2 nodes: $439.90

Windows NT 3.5
Price for 2 nodes: $990
Microsoft, 800/426-9400
Reader service no. 786

Ares Offers a PCI-VESA Combo PC:



JOHN GREENLEIGH

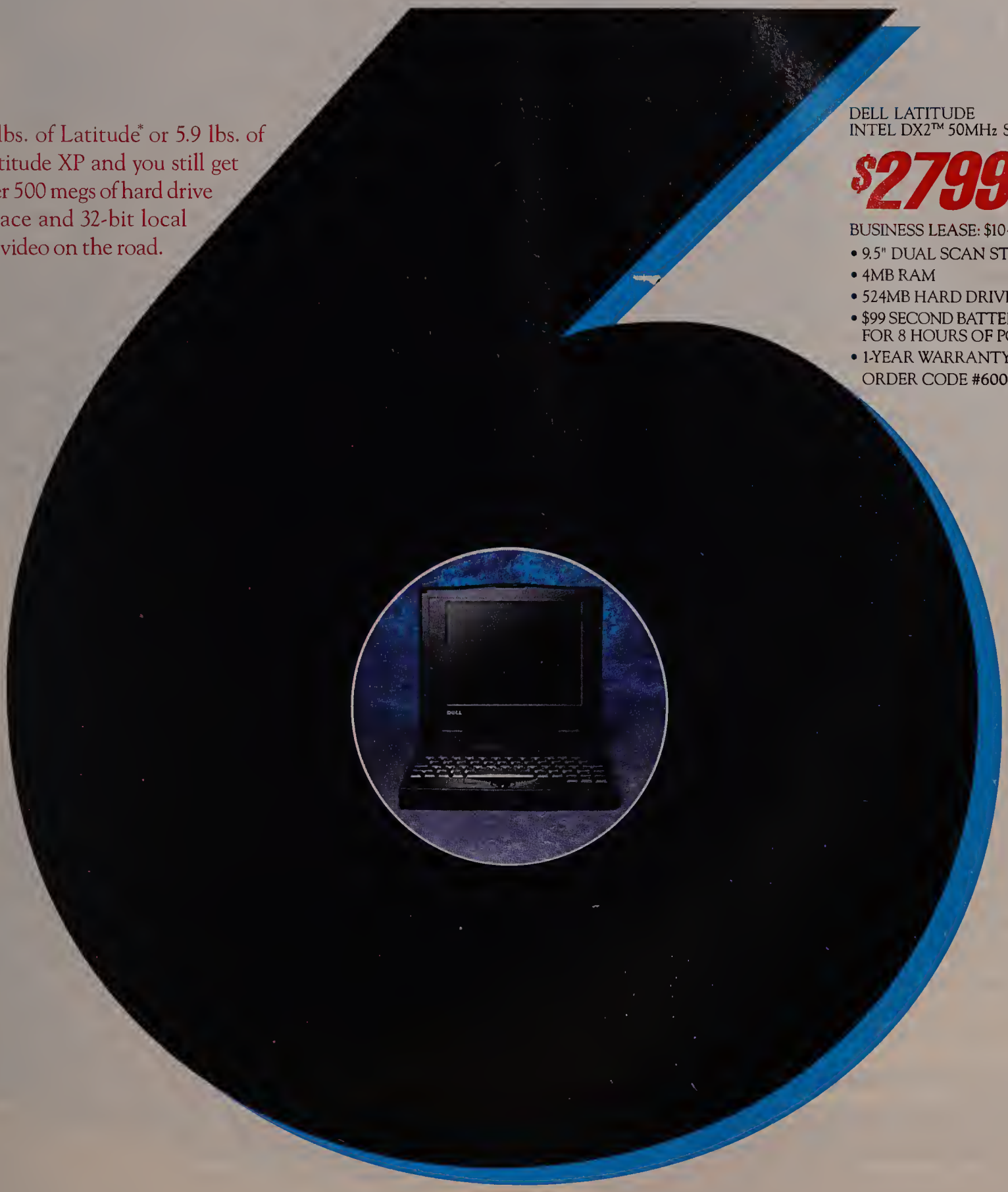
Can't decide on a local bus? Clone maker Ares Microdevelopment of Farmington Hills, Michigan, has a novel solution—PCI and VESA in a single computer. Ares's new PCI-VESA system includes six free bus slots: two PCI, one VESA, two ISA, and a combination ISA-PCI. (The system includes one extra PCI slot that holds a Genoa video accelerator card and one additional VESA slot with a hard drive controller.)

The Ares PCI-VESA system comes in a variety of configurations. A $2195 system includes a 66-MHz 486DX2 processor, 8MB of RAM (upgradable to 128MB), 256K of secondary RAM cache, a 420MB hard drive, a 64-bit PCI video accelerator with 2MB of DRAM, a CD ROM drive, a sound card, speakers, and a 15-inch color monitor.

According to the PC World Test Center, Ares's 66-MHz 486DX2 PCI-VESA system scores slightly above average for its processor class, although about 27 percent slower than the fastest 66-MHz 486DX2 we've tested.

Nevertheless, if you need a system that has the flexibility to handle both VESA and PCI cards, Ares's hybrid PC is worth a look. Ares Microdevelopment, 800/322-3200. Reader service no. 787

6 lbs. of Latitude* or 5.9 lbs. of Latitude XP and you still get over 500 megs of hard drive space and 32-bit local bus video on the road.



DELL LATITUDE
INTEL DX2™ 50MHz SYSTEM

$2799

BUSINESS LEASE: $104/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 524MB HARD DRIVE
- $99 SECOND BATTERY (REQUIRED FOR 8 HOURS OF POWER)
- 1-YEAR WARRANTY

ORDER CODE #600014

DELL™

To Order, Call

800-284-1160

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11DDG

All in One: The QMS 2001 Knowledge System PC crams a typical desktop's worth of hardware into one desktop unit: You get a 486SX-33 PC (with 4MB of RAM, a 120MB hard drive, and a 3½-inch floppy drive); a 600-dpi, 6-ppm laser printer; a 400-dpi copier; a 400-dpi scanner; and a 9600-bps fax-modem. The Knowledge System comes with a 14-inch super-VGA monitor, a keyboard, a mouse, and preloaded software including Windows. The street price should be $5000—about what you'd pay if you bought each piece of hardware and software individually.

Convenience and security are the rationale behind the Knowledge System's all-in-one approach. The bundled software makes everyday tasks—such as scanning a document, putting a fax header on it, and sending it—more private. You avoid the hassle of installing peripherals, and you contact just one vendor for all your hardware support. Analysts expect the Knowledge System PC to interest corporate departments (such as legal, human resources, and internal audit) that require above-average privacy, as well as remote offices that need one unit to handle all office functions.

A major drawback to the Knowledge System: QMS offers no model with a hard drive larger than 120MB, and the maximum RAM is 20MB. For those who want everything but the PC, QMS sells a device that hooks up to your existing PC's parallel port and is street-priced at about $3000.

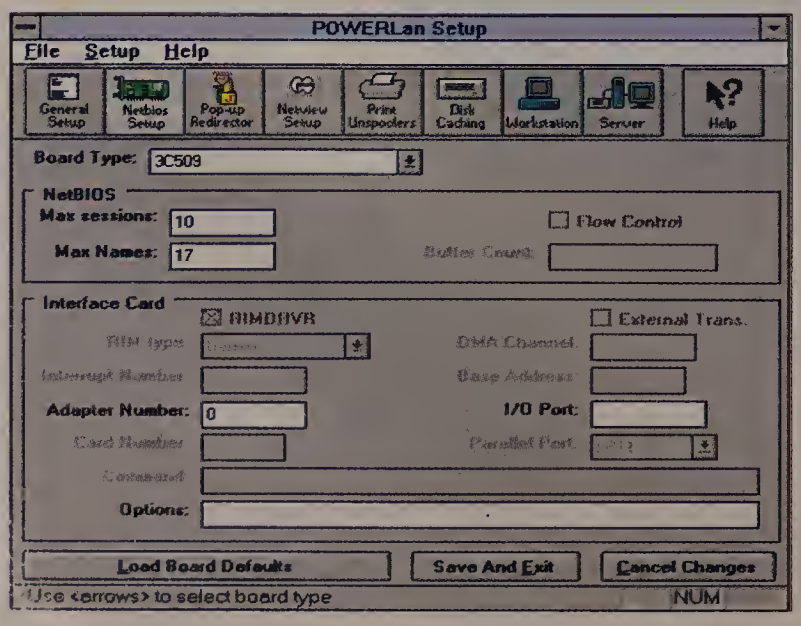
This is one of the first of a new crop of multifunction devices that are expected to arrive during the next 12 months, says International Data Corporation senior analyst Marco Boer. Boer expects that these products won't include a PC, will use ink jet printers instead of lasers, and will cost under $2000. QMS, 800/523-2696, 800/777-7782. Reader service no. 788

Continued from page 68

just about any computer. Combined with its TCP/IP support, this solution wins our favor for complex multiplatform networks.

Artisoft Simply LANtastic 5.1

Simply LANtastic is an elegant solution for small and home offices and is the most hassle-free serious networking product in this roundup. Installation is simple: Plug in the proprietary 16-bit adapter cards, connect the cables, and install the software. The process took 15 minutes on two test PCs, and we didn't need the manual. (Coactive Connector installs faster but has a lower level of functionality.) Simply LANtastic supports 200 feet of cabling and 20 PCs.



POWERLAN'S INSTALLATION IS A CHALLENGE if you venture beyond the proprietary drivers, and the documentation is weak.

Novell Personal NetWare 1.0

The only real reason to consider Personal NetWare is if you need to run a peer network that must be tightly integrated with a full server-based NetWare installation. This would be the case if you wanted both interdepartmental peer services and access to a broader array of corporate network resources. Novell recommends connecting five to ten computers. In addition, NetWare has a terrible user interface, it's only slightly less difficult to install than NetWare 3.12, and it requires a hefty 640K of memory.

Coactive Computing Coactive Connector 2.0

The easiest networking product to use, Coactive Connector 2.0 supports primitive electronic messaging between DOS and Windows systems and printer and file sharing. It installs quickly, plugging into the PC's parallel port, and it works with DOS and Windows PCs and Macs. It connects up to 32 PCs within 1000 feet. A pass-through port lets you attach a parallel printer to the adapter. Shared files must be stored within a central directory, and Coactive is *slow* (26 kilobits per second). But it works.

What's Right for You

For a small DOS and Windows installation, Simply LANtastic 5.1 best carries the weight. For an all-Windows network, choose Windows for Workgroups 3.11. For low-level Mac-to-PC connections, consider Coactive Connector. For more robust multiplatform networks, however, LANtastic 6.0 is your best choice.

There are other products and approaches to connecting computers yourself: Rose Electronics makes a powerful line of easy-to-install printer- and resource-sharing devices. Moses Computers' Moses LAN offers a variety of peer-to-peer solutions, from relatively simple file-sharing options to more robust E-mail–capable products.

Finally, if you have an eye on the future, look for a TCP/IP LAN. This type of product provides peer services while giving every machine the capability to act like a traditional server. The next version of Windows, Chicago, is slated to incorporate TCP/IP protocols; and TCP/IP is the native language spoken by most machines on the Internet. IBM offers TCP/IP extensions for both DOS and Windows, LANtastic 6.0 offers optional TCP/IP support, and a robust group of TCP/IP add-on products, led by NetManage's Chameleon, is emerging for Windows, Windows for Workgroups, and Windows NT.

—Jeff Noxon, Joe Abernathy, and Russell Glitman

JOHN GREENLEIGH

5

5 different ways how, technically speaking, we give you 8 hours of battery life.

1. Latitude XP is powered by a new Lithium Ion battery. You get up to 30% more power for the same weight as NiMH batteries.

2. Dell has created the smart Lithium Ion battery—a battery with built-in microprocessor and indicator light to keep you aware of available power.

3. Latitude XP's smart CPU dynamically adjusts energy consumption to the specific software application being used.

4. With our easy to use Windows power management, you can choose from 4 pre-set levels or create your own custom settings.

5. Our Lithium Ion battery lets you fast charge your battery anytime without the memory effect, common to NiMH batteries.

DELL™

To Order, Call

800-284-1160

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

In Mexico City,* Call 800-228-7811

Keycode #11DDH

DELL LATITUDE XP
INTEL DX4 75MHz

$3699

BUSINESS LEASE: $134/MO.

- 9.5" DUAL SCAN STN COLOR
- 8MB RAM
- 524MB HARD DRIVE
- 3-YEAR WARRANTY
- NEW LITHIUM ION BATTERY

ORDER CODE #600013

Manage Your Group's Documents

PC Docs Open and SoftSolutions let you store and track all your key documents on the net.

If old-fashioned file cabinets in your office are giving way to hard disk storage on a local area network, it's time to consider buying document management software. These network-based programs let everybody on the net file, locate, and retrieve documents easily.

A document management package is a valuable tool when a DOS file name doesn't give you enough information to find the file you want, and when other people in your organization need access to your documents as well as to their own. By controlling where you save your work and then indexing it, these packages let you and your co-workers find saved documents in a variety of ways. Document managers also make it easier to retain your organization's intellectual property and to leverage information by making it fast and easy to locate anything that's stored on the network.

Document managers work by replacing the ordinary File•New and File•Save dialog boxes in your applications software with a screen—called a *profile*—in which you enter information that will help you find the document later, including the document's topic, type, author, creation date, and so on. Completing this profile information is analogous to writing a file name on a manila folder tab and filing the folder in a specific place in a file cabinet.

The next time you select File•Open, a blank profile screen appears. Enter what you know about the document you're looking for, and the document manager will return a list of likely candidates. You don't need to know the file name to find the document; you can enter the name of the person who created it, the topic, the date it was created, or any other range of criteria.

In addition to storing the information contained in the profile, document managers let you perform full-text searches on the information in documents. If you know that a letter contains the phrase *flight of fancy* you can search on *fancy*, and the document manager will find all documents containing that word. The search happens quickly, because the document manager searches an index of everything that's been saved. Be aware, though, that full-text searches can't find information that's been added since the document manager last updated its index.

At first, it's a little disconcerting to have to trust the document manager to find the document for you. But the process really does work quite well.

Document managers not only locate documents, they manage them for the systems administrator. For example, when you

INSIDE NETWORKING

76 / Making Work Flow Work
This firm found its Action Technologies system paid off big time—eventually.

80 / Buying Tips: Choosing the Right Fax Server

To reach *PC World Networking Edition*, contact us at 77 Franklin St., Boston, MA 02110; 617/482-8470, 617/426-0235 (fax); 71154,443 on CompuServe.

RIGHT: JAMES KRAUS; ABOVE: JEFF BERLIN

DELL LATITUDE XP
INTEL DX4 100MHz

$4799

BUSINESS LEASE: $173/MO.

- 9.5" ACTIVE MATRIX TFT COLOR
- 8MB RAM
- 340MB HARD DRIVE
- 3-YEAR WARRANTY
- NEW LITHIUM ION BATTERY

ORDER CODE #600012

4

DX4 100 MHz processor to be exact–the fastest clock speed you can buy in a notebook.

DELL™

To Order, Call

800-284-1160

In Canada,* Call 800-668-3021

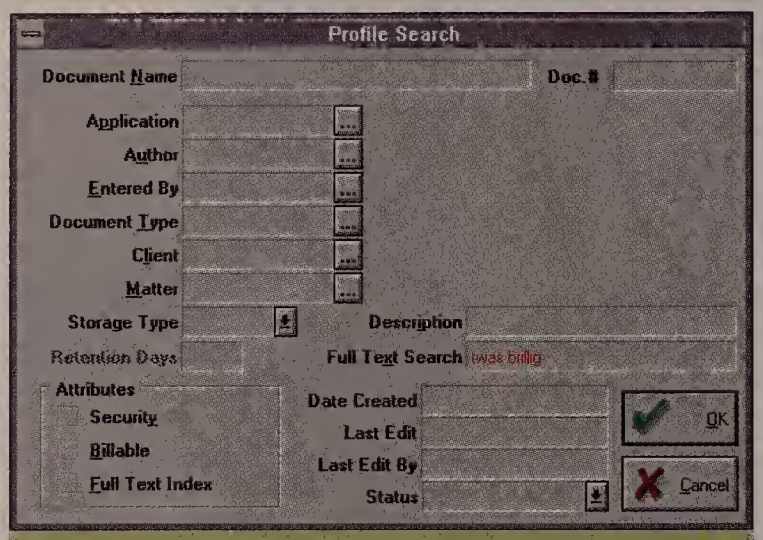
Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11DDJ

assign a document type, you can also specify the number of days to keep it, the number of versions to keep, and other options. Later, the system administrator can delete expired documents.

Make sure the document management package you buy supports the major software applications your organization uses. The leading packages already work with most major word processing and spreadsheet software, and more applications are being added all the time. Note that because of the way these packages "hook" into word processors, spreadsheets, and other applications, they will probably void some integration features offered by the Windows office suites.

Here's a quick summary of two veteran document managers.



PC DOCS OPEN 2.0'S PROFILE TOOL does it all. Enter document information, assign document security, and enter phrases for full-text searches in one place.

PC Docs Open 2.0 for Windows

PC Docs Open 2.0 is a Windows-based document manager that works with SQL database packages from vendors such as Gupta, Microsoft, Oracle, Sybase, and Watcom to profile, store, and retrieve business documents. (To run PC Docs Open, an organization must be running one of these SQL databases, but that's an issue for network administrators to worry about.) The package runs on networks using Novell's NetWare, Banyan's VINES, Microsoft's LAN Manager and Windows for Workgroups, and other environments.

When you start PC Docs Open, you see a desktop with icons for folders and applications—a little like the OS/2 Workplace Shell. You organize documents by project, client, subject, or any other criteria, then place them into desktop folders; to start your work, click a folder and then select the document you want.

To start a new document, click the relevant application's icon within the PC Docs desktop. When you save the document, PC Docs Open asks for profile information. To find a document, click the Quick Retrieve button or the Profile Search button. To find a document via a full-text search—for example, to see if someone else has already written the kind of letter you need—enter a key word or phrase in the Profile's Full Text Search box. PC Docs Open will return a list of all filess containing the phrase.

PC Docs Open is sold by authorized integrators—a wise approach, because installation and configuration can be complicated, and the manual isn't written for amateurs. With PC Docs Open, the systems administrator has to create the links between applications and the document manager. For example, to link 1-2-3, the administrator must copy a certain file to the 1-2-3 add-in directory and edit 1-2-3's INI file.

PC Docs Open finds documents created by the most popular Windows-based applications, including Ami Pro 3.0, Word 6.0, WordPerfect 6.0, 1-2-3 4.0, Excel 4.0, and Quattro Pro 5.0.

SoftSolutions

SoftSolutions 4.0 for Windows takes a different approach. Rather than using a separate database package to store document profile information, it uses its own database structure. Any application that's compliant with Open Database Connectivity (ODBC), however, can get to the data.

The program supports OLE 2.01 and works with Novell's NetWare, Microsoft's LAN Manager, Artisoft's LANtastic, and a wide variety of other network operating systems.

While SoftSolutions is also sold only by authorized integrators, installation is simple—the software does most of the work for you. The search capabilities are powerful; you can use buttons to write search code that contains Boolean operators (the kind that let you search using phrases like 'Lucy AND Desi' or 'Lucy OR Desi').

SoftSolutions' profile is the centerpiece of the package. The profile appears when you start the application; once you fill it out, you select either the Add button to create a new document or the Search button or Full-Text Search button to find a document. The program does provide a desktop metaphor similar to that used by PC Docs Open, but it's currently an extra-cost option (the company says that it intends to include it in the next release).

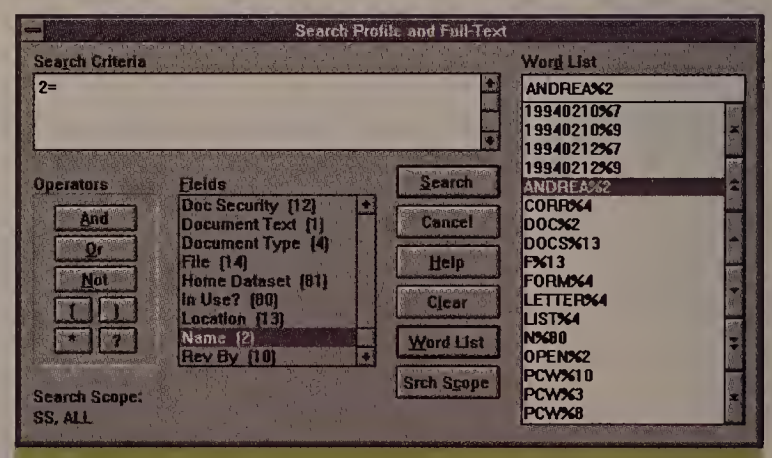
SoftSolutions was recently acquired by WordPerfect Corporation and is now part of Novell's strategy to expand its presence in the work-group application arena.

—Andrea Powers

Andrea Powers is an associate editor for PC World *who can be reached at the magazine's Boston office.*

PC Docs Open 2.0
PC Docs Inc.
904/942-3627, 904/656-5559 (fax)
Price: $299 per workstation, $495 per server; if bundled with Sybase or Oracle, $395 per workstation, $695 per server.
Reader service no. 710

SoftSolutions 4.0 for Windows
SoftSolutions
801/226-6000, 801/224-0920 (fax)
Price: $495 per file server, $295 per workstation; additional Document Desktop $250 per workstation, additional NetWare Server Enhancement Module $1995.
Reader service no. 711



SOFTSOLUTIONS 4.0'S SEARCH PROFILE AND FULL-TEXT TOOL lets you conduct Boolean searches or search on the profile, a database field, or just a phrase.

DELL LATITUDE
INTEL DX2 50MHz SYSTEM

$2499

BUSINESS LEASE: $93/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 340MB HARD DRIVE
- $99 SECOND BATTERY (REQUIRED FOR 8 HOURS OF POWER)
- 1-YEAR WARRANTY

ORDER CODE #600010

A 3.3 volt processor in the new Latitude. Consumes fewer watts, pumps out hours of power, so you can cruise.

DELL™

To Order, Call

800-284-1160

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11DDK

Struggling to Make Work Flow Work

Young & Rubicam keeps business moving with Action Technologies' Notes-based system.

YOUNG & RUBICAM WORRIED THAT EMPLOYEES WOULD RESENT its work-flow system, but "if the computer helps, they welcome it," says Chuck Riley.

A work-flow system that manages new-client business has paid off handsomely at Young & Rubicam's San Francisco office. Based on Lotus Notes, the advertising agency's system receives client requests, tracks negotiations, and helps prepare a report for the office's creative team that includes cost estimates and time lines.

Executive vice president and group director Chuck Riley estimates that his 11-person account management group now works 50 percent less overtime, performs 64 percent fewer "redos" resulting from miscoordinated processes, and gets a higher percentage of jobs done both on time and on budget. But the experience left the Y&R pioneers with plenty of arrows in their backs, Riley says.

When his group was picked 18 months ago by Y&R's chief information officer as the firm's guinea pig for a computerized work-flow system, Riley had plenty of doubts—all of which were confirmed in the short run. "The technical people prime the pump and get the businesspeople interested, but we want things delivered, and the technical people can't always do that," Riley explains.

Y&R chose Notes and Action Technologies' work-flow kit (which was being adapted to Notes) for its new system. While Y&R won't disclose the cost, Riley's group had to install a network and a Notes server, in addition to upgrading several user workstations to run Windows.

To start the project, Riley, several colleagues, and Action employees first had to analyze the way work was being handled at the agency. After a four-month investigation, Riley discovered how people *thought* things worked. Then he uncovered unnecessary and redundant procedures, and at the same time discovered that a number of important tasks were not being done at all.

With this information in hand, Y&R personnel and Action developers spent three months building a system that would monitor work processes, making sure every process was done on time and in the proper sequence.

Every task is tied to a time line. When a manager sets a deadline, prompts automatically go out to all the individuals involved. Users, who for the most part work with either Microsoft Word or Excel, toggle into Notes to see these on-screen alerts. If they decide not to handle the task immediately, a pending-item icon appears in the Notes database. When they are ready to tackle the job, "they just open the database, and accomplish certain tasks to make the notification go away," says Riley.

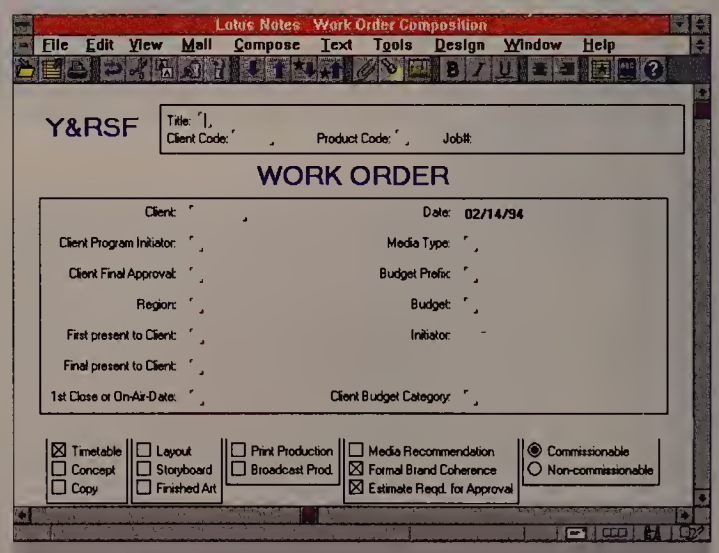
Bosses can quickly view progress on a given task—and so can customers, connected from remote sites via Notes. Y&R conducted research before and after installing the software to determine whether employees resented so many people peering over their shoulder electronically. But Riley says that the vast majority of employees see work-flow software as a help, rather than an intrusion: "If the computer helps them do their job, they welcome it."

A far bigger problem was software stability—the project ran for about a year before the firm's Notes 3.0 server stopped crashing. Because of the instability, Riley said, "people quickly reverted to their old paper ways." Even when the system ran smoothly, users didn't trust it and continued to file paperwork on everything as a precaution. Riley is still working to convince employees that the software is finally safe.

Given the overall success of this experiment, Young & Rubicam plans to introduce work-flow software into other areas of the business. Ironically, however, Notes crashes have left such a bad taste that future systems may run Action software on the Microsoft/Sybase SQL Server instead.

—Douglas Barney

Douglas Barney is a senior editor for InfoWorld *in Boston.*



CUSTOMIZED LOTUS NOTES FORMS like this work-order request drive Y&R's work-flow system.

DELL LATITUDE
INTEL SX 33MHz SYSTEM

$2098

BUSINESS LEASE: $78/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 200MB HARD DRIVE
- SECOND BATTERY INCLUDED*
- 1-YEAR WARRANTY

ORDER CODE #600009

2 bays in the Latitude* let you plug in two four-hour NiMH batteries for a total of, yep, you guessed it, 8 hours of battery power.

DELL™

To Order, Call

800-284-1160

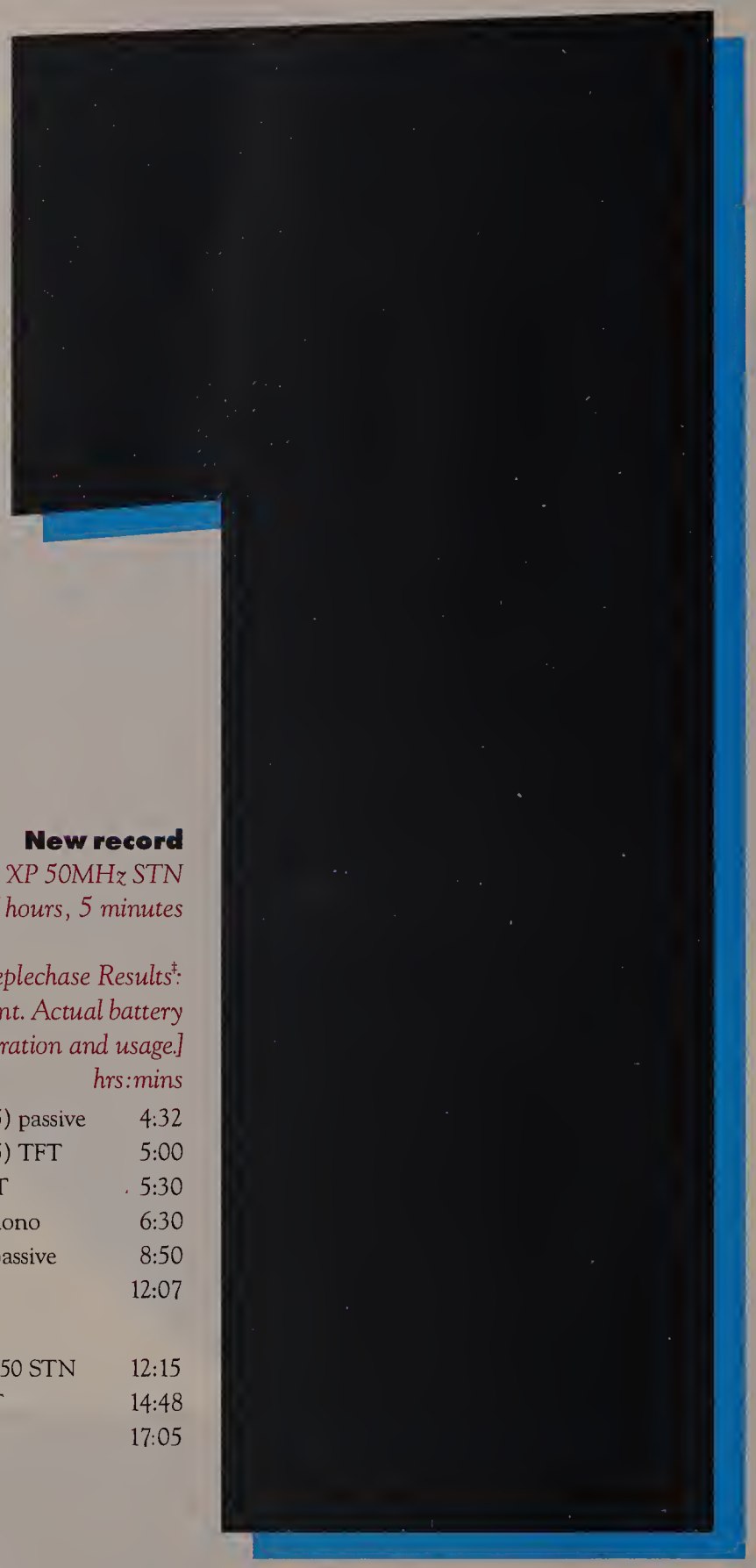
In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

In Mexico City,* Call 800-228-7811

Keycode #11DDL

#1 in the independent VeriTest Steeplechase Battery test‡. In fact, the Dell Latitude XP destroyed the previous battery life record by almost 5 hours.



External expansion via our **Advanced Port Replicator** means your Latitude XP turns into a desktop when you get back to the office.

Hot swappable **Type II and III PCMCIA slots** and Dell configuration software let you swap most PCMCIA goodies at will.

19mm Integrated Trackball with palm rest works in tandem with XP's fold-down feet so your hands can rest easy while they're working hard.

New record
Dell Latitude XP 50MHz STN Steeplechase: 17 hours, 5 minutes

Typical VeriTest Steeplechase Results‡: [Testing with power management. Actual battery life will vary with configuration and usage.]

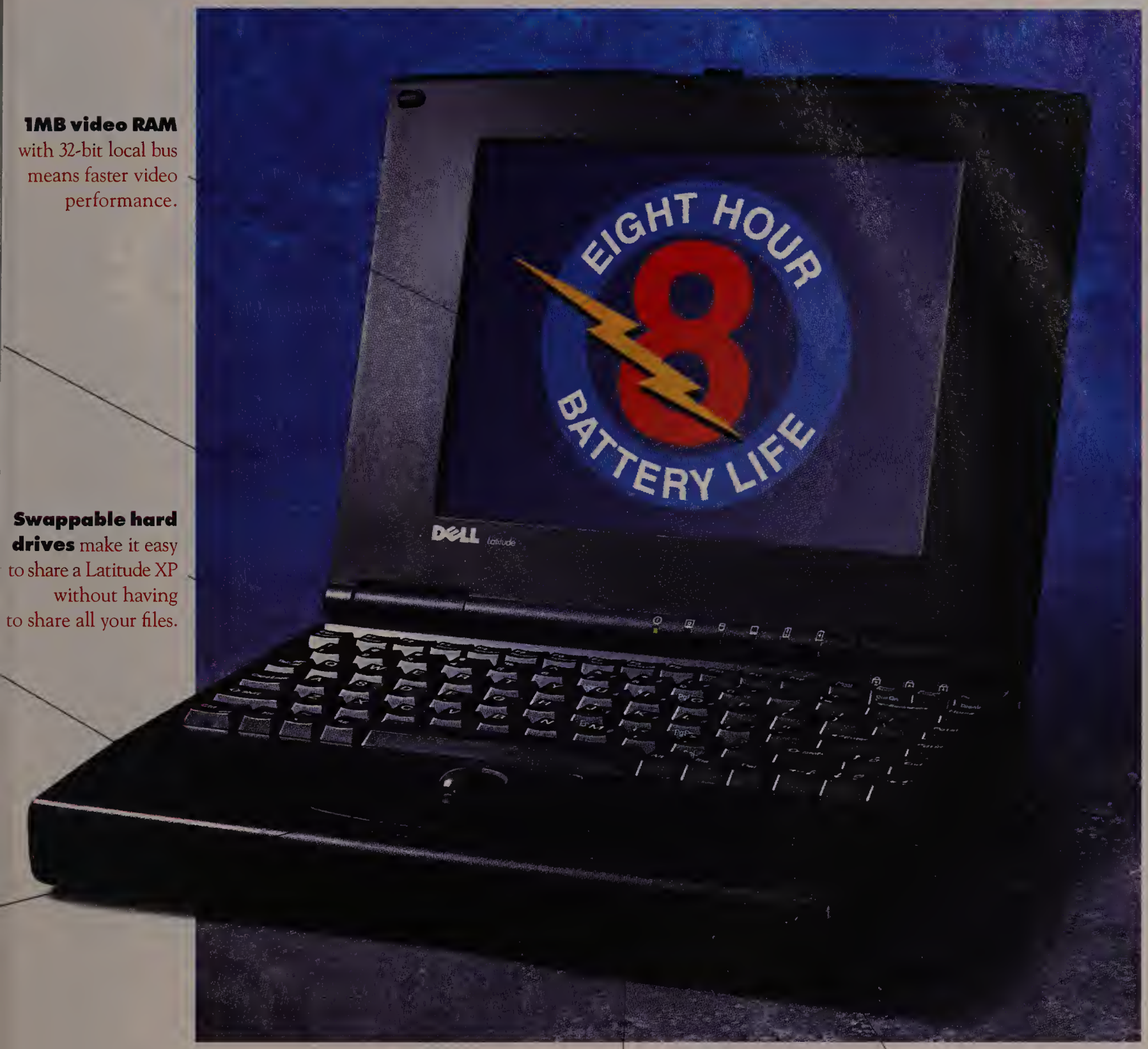
	hrs:mins
Compaq Contura 4/25c (SL/25) passive	4:32
IBM ThinkPad 755Cs (DX4/75) TFT	5:00
Toshiba T4800ct (DX4/75) TFT	5:30
IBM ThinkPad 500 (486/slc) mono	6:30
IBM ThinkPad 350C (SL/25) passive	8:50
Previous record for 486 mono	12:07
NEW RECORDS:	
Dell Latitude, 2 batteries DX2/50 STN	12:15
Dell Latitude XP DX4/100 TFT	14:48
Dell Latitude XP DX2/50 STN	17:05

intel inside

*‡So you've come down here to find out about this Steeplechase thing. Well, it's not a horse race, but a thorough test of battery life. The Steeplechase test includes mechanical typing, pausing, task switching and printing in MS Windows v3.1, MS Word for Windows v6.0 and MS Excel v5.0. All numbers represent an average of at least two trials with power management function enabled. Test simulates executive usage, i.e. carrying notebook between meetings and intermittent use. Competitors' times are published in Portable Computing Magazine. For a complete copy of the VeriTest results, call our TechFax℠ line at 800-950-1329. †This 3-year limited warranty consists of Dell's standard return-to-factory warranty during the first year, plus 1-year of next-business-day on-site service provided by BancTec Service Corp. during the first year, plus a 2-year parts only contract for years 2 & 3. *Latitude XP is powered by one Lithium Ion battery. Latitude is powered by a NiMH battery, with the option of replacing the floppy drive with a second NiMH battery, which will increase the weight of the Latitude by 0.5 lbs.*Prices valid in the U.S. only. Some products and promotions may not be available outside the U.S. Prices subject to change without notice. ◊Business leasing arranged by Leasing Group, Inc. Intel and the Intel Inside logo are registered trademarks and DX4, DX2 and SX are trademarks of Intel Corp. Dell disclaims proprietary interest in the marks and names of others.* *©1994 Dell Computer Corporation. All rights reserved.*

1MB video RAM with 32-bit local bus means faster video performance.

Swappable hard drives make it easy to share a Latitude XP without having to share all your files.



DELL LATITUDE XP
INTEL DX4 75MHz SYSTEM

$3399

BUSINESS LEASE: $126/MO.

- 9.5" DUAL SCAN STN COLOR
- 8MB RAM
- 340MB HARD DRIVE
- 3-YEAR WARRANTY
- NEW LITHIUM ION BATTERY
  ORDER CODE #600011

For programs requiring major RAM, we offer **RAM expansion up to 36MB** on Latitude XP.

CommWorks, RadioMail and America OnLine free and pre-installed so you never have to be out of touch.

DELL™

To Order, Call

800-284-1160

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

In Mexico City,* Call 800-228-7811

Keycode #11DDM

Buying Tips: Choosing the Right Fax Server

Born as a clever blend of photocopier and telecommunications know-how, fax keeps stirring new technologies into the mix. Once fax joined with PC technology, you could fax virtually anything you produced on your PC. Now network support is being added, promising to make faxing as common for PC users as printing, word processing, and electronic mail. And with a shared fax system in place, you don't need to dedicate a separate phone line and fax-modem for each person who needs to send and receive faxes.

Low-priced solutions offer both modest cost ($500 to $1000 including the fax-modem) and modest features. For example, cc:Fax, cc:Mail's fax extension, enables you to fax simple text and attached graphics.

If E-mail is well ensconced on your network, then the addition of faxing will be an easy leap for everyone. However, these low-end fax products can't babysit faxes that are queued for the fax-modem, or provide feedback about undelivered faxes.

The higher-priced solutions from Alcom, Castelle, Cheyenne Software, Intel, and others provide tracking software that lets users monitor the flow of outgoing faxes. They also offer other amenities, such as public and personal fax address books, usage logs, and the ability to balance fax traffic so that a blitz of outgoing press releases from the marketing department doesn't hold up a bulletin from the CEO. Additionally, many products offer gateways to popular E-mail systems so you can create an E-mail message and send it as a fax.

Depending on the number of employees and fax lines, you can pay anywhere from $600 for a five-user, single-modem system to a price in the four-figure range. You must also factor in the cost of a dedicated high-powered PC or a more powerful server.

Front-end fax software should provide full-featured fax viewing and let you scale and rotate fax images and export faxes in common graphical file formats.

Most high-end products let you automatically print incoming faxes just like you do with a fax machine; in addition, most are compatible with standards that let you intelligently route inbound faxes. With the Direct Inward Dialing standard, each user is assigned a unique fax phone number, and all user fax numbers route calls to the same fax line; the server identifies the number dialed and routes the fax accordingly. With Dual-Tone Multifrequency, the sender manually enters a special code after the sending and receiving fax devices connect; the code identifies the recipient. A third standard lets you dial the extra code at the same time as your destination phone number; the fax-modem saves the code and sends it automatically after connecting.

--Bill Lawrence

Bill Lawrence is part of the team that manages a 3000-workstation network.

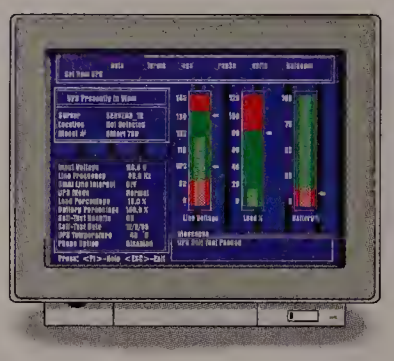
Can Your UPS Do This?

yes NetWare Tested and Approved

MADE IN USA

Battery backup power, line interactive design, auto-shutdown ability. Sure your UPS has these features. But only the new Smart Series UPS from Tripp Lite allows you to view and control power situations on your network from any network station — including remotely via your laptop! Now, you can get power monitoring and control that's as mobile as you are.

With more power monitoring information, and more ability to use this information to control your system, the Smart Series UPS adds a level of reliability to your network you simply cannot get with other UPS systems.



Smart Series Exclusive #1

PowerAlert Plus software allows you to view operating information on any network station from any network station.

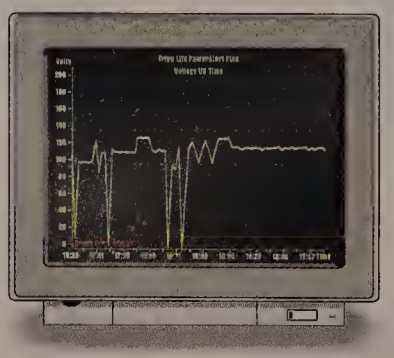
Smart Series Exclusive #2

PowerAlert Plus records all power problems network-wide to one easy-to-view Master Log.

250 VA to 2000 VA models available

FIND OUT MORE

Call now and we'll send you our FREE VIDEO or your no-obligation sample unit. 312/755-8741 Ask for Dept. S52



Smart Series Exclusive #3

PowerAlert Plus' built-in graphing utility allows you to graph incoming power anywhere on the network.

ULTIMATE $50,000 LIFETIME INSURANCE

TRIPP LITE EST 1922

"THE POWER PEOPLE"

500 N. Orleans, Chicago, IL 60610

Tel: 312/755-8741 • Fax: 312/644-6505

The Smart Series UPS from Tripp Lite
The Power Protection Price Leader

Circle 81 on reader service card

Go Ahead, Get Carried Away

GATEWAY2000
P4D-66
P4D-66

GATEWAY2000
RESET
Microsoft Office

WORK
HOME
Better Homes and Gardens
Healthy Cooking
CD

Experience the World of Gateway 2000!

Go ahead. Let yourself get carried away. Because when you buy a computer from Gateway 2000®, you can lose yourself in a whirlwind of extraordinary computer systems and fantastic software. You'll feel like there's absolutely nothing on earth you can't do! So let your imagination run wild. Soon you'll be opening the doors to Gateway 2000 where prices are a breeze and computer dreams really do come true!

Most Gateway desktop systems now include larger hard drives, including a 1GB hard drive on our P5-90XL Pentium™-based machine. So there's no way you can get caught short of space. A TelePath™ fax/modem is included on our new Pentium-based multimedia systems. And CD-ROM drives are standard on all desktop systems. Just imagine what you can accomplish with Microsoft's Office Professional, including the latest versions of MS Word, Excel, PowerPoint® and Access®, now standard on all 486 PCI and Pentium-based systems.

A standard three-year limited parts warranty on all desktop systems and Gateway monitors tops off our tradition of bringing you the best service and support in the industry.

Sound too good to be true? Well, that's not all. The Gateway HandBook® 486 portable PC is now priced at legendary low prices.

Gateway 2000 has grown to become a Fortune 500 company, but we're still the down-to-earth Midwesterns who have always given you a good old-fashioned value. Go ahead, take a visionary's leap into the Gateway 2000 experience. Soon you'll be saying, "There's no place like Gateway, there's no place like Gateway."

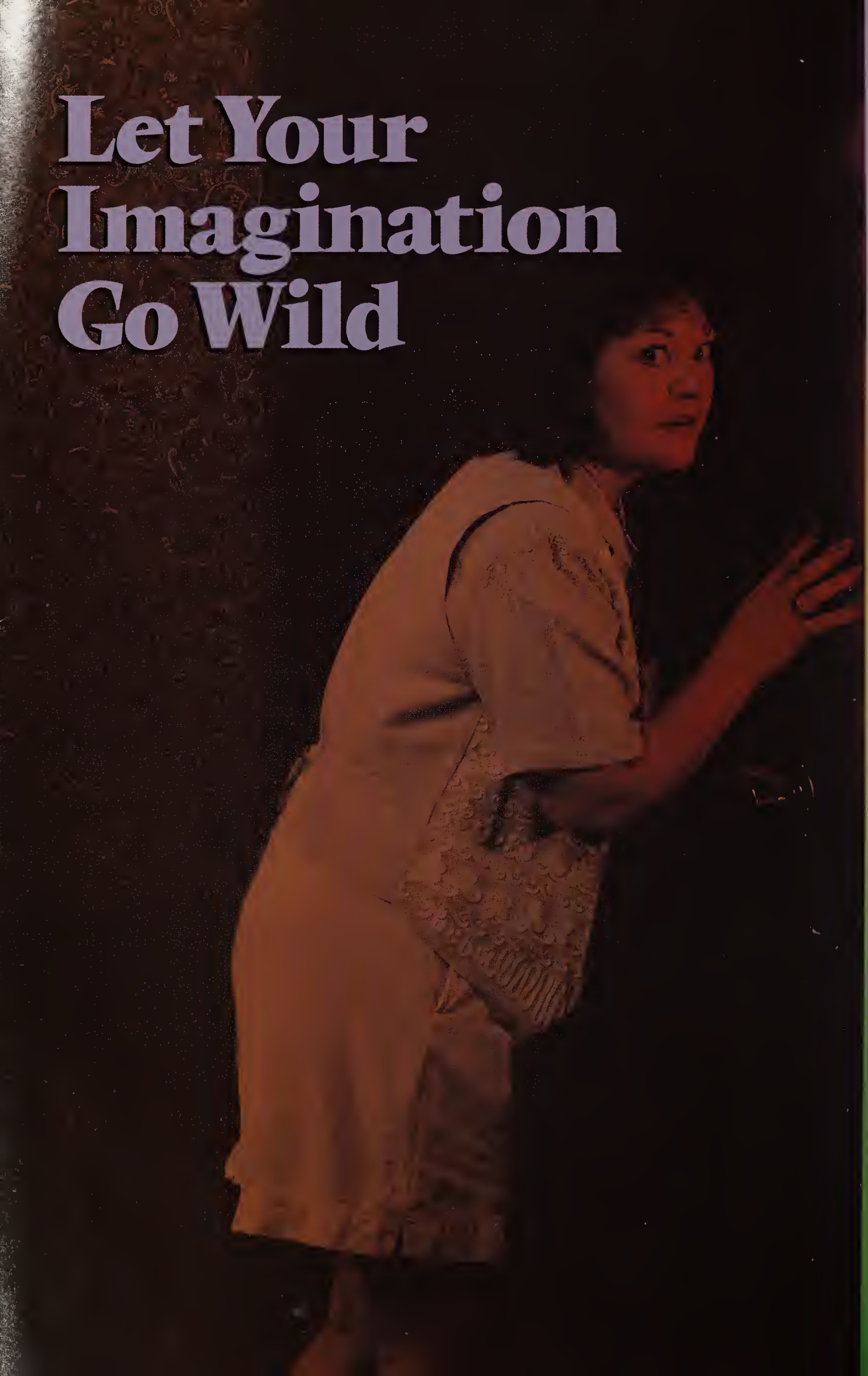
GATEWAY2000

"You've got a friend in the business."®

800-846-2065

All the incredible talent in this ad is provided by Gateway 2000 employees and family members.

Let Your Imagination Go Wild



Everything Under The Sun!

Supernatural power. Mesmerizing features. Stunning software. It's the Gateway 2000® experience. A place where you can have the best CPUs in the land — and so much more — when you buy a Gateway 2000 Pentium™-based system. And while others are huckstering their stripped-down Pentium-based computers, Gateway presents systems packed with the all the stuff dreams are made of!

There's virtually no end to the features included: hard drives up to 1GB, CD-ROM drives, outstanding sound and video performance, the best software, fax/modems on two new multimedia models, and a standard three-year limited parts warranty.

Your dream machine no longer eludes you. Gateway 2000 is making those dreams come true!

Raising The Roof Extras

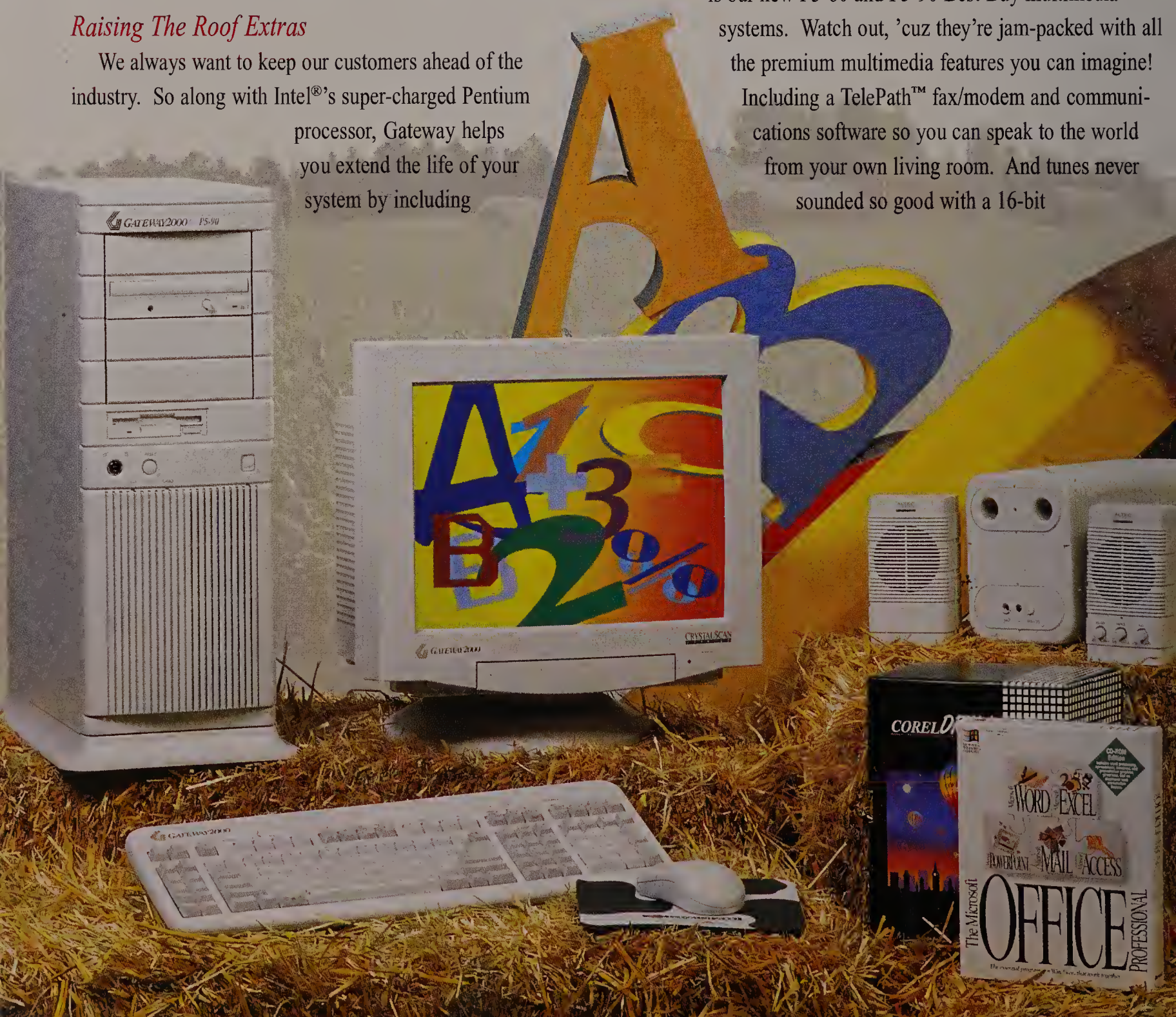
We always want to keep our customers ahead of the industry. So along with Intel®'s super-charged Pentium processor, Gateway helps you extend the life of your system by including incredible 540MB, 730MB or 1GB hard drives on all Pentium-based systems. Get used to the feeling of being spoiled, because you also get CD-ROM drives, superior video performance *and* a ton of memory on *all* desktop systems!

All Pentium processor-based models include a PCI local bus and an enhanced PCI/IDE controller allowing your hard drive to transfer data up to twice as fast as non-enhanced systems.

And now Gateway's high-quality desktop systems *and* Gateway monitors are backed by a three-year limited parts warranty. Believe it — this is one of the best warranties you'll find anywhere!

Multimedia Mania

For those who insist on only the very best, your Shangri-La is our new P5-60 and P5-90 Best Buy multimedia systems. Watch out, 'cuz they're jam-packed with all the premium multimedia features you can imagine! Including a TelePath™ fax/modem and communications software so you can speak to the world from your own living room. And tunes never sounded so good with a 16-bit



sound card and Yamaha® stereo-quality speakers. Play your audio CDs, hear audio clips or record audio all in perfect harmony.

Wondering what "multimedia" *really* means for you? It's a whole new universe of knowledge, entertainment, communication *and* educational capabilities. Talk about being entranced! You'll experience interactive, full-motion video and stereo audio. And Gateway gives you the key to this universe in a super-fast, feature-packed machine.

Get the best of all possible worlds with these new P5-60 and P5-90 Best Buy multimedia machines!

Software Nirvana

It's a sweet deal. All Gateway Pentium-based systems now come with Microsoft Office Professional, an incredible combination of Microsoft's most popular business applications, including Microsoft Word, Excel, PowerPoint® presentation graphics program, and Access® database, all on a single CD with on-line manuals. These programs in Office Professional are so tightly integrated, they work together as if they were a single program. Also included is Corel Professional Photos CD Sampler with tools to view Photo CD images.

Call for more great software options including our value-packed Multimedia Starter Pack.

P5-90XL Paradise

Is it fantasy or for real? Well, it's the Gateway P5-90XL. This ultimate high-flying Pentium-based PC has a larger-than-life 1GB hard drive. You're gonna get all the power and speed you need for today *and* tomorrow! And an ATI GX video card using the Mach 64 graphics accelerator, one of the first and fastest 64-bit accelerators on the market. It's awe-inspiring to see the display on the 17-inch CrystalScan® monitor. Sound, you ask? Ensoniq®'s Soundscape™ wavetable sound card makes a staggering difference in audio quality. And you'll get a great balance of crisp highs and plenty of heart-pounding bass — in full stereo sound — from the Altec Lansing ACS-31 speakers, with subwoofer.

And for the system of *your* dreams, we'll configure a system specifically to fit your needs. Get everything under the sun with a powerful value-packed Pentium-based system from Gateway 2000!

GATEWAY2000

"You've got a friend in the business."®

800-846-2065

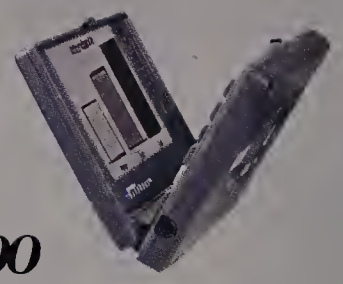
ENHANCED IDE

intel inside

pentium PROCESSOR

You'll be in paradise with a loaded Gateway P5-90XL machine!

Know No Boundaries



GATEWAY2000 COLORBOOK

You'll be transported to outer bounds when you discover the ColorBook™ from Gateway 2000.® Experience the rapture of color portability *and* performance with a 250MB hard drive on our 50MHz and 75MHz models. A rainbow of 256 brilliant colors in VGA mode bursts from an incredible 10-inch dual-scan screen on three ColorBook models. You won't find another portable screen this big, this affordable, anywhere else.

And while everyone else is hiking up their color portable prices, Gateway still offers you an incredible value on our feature-packed ColorBooks, from the $1,999 SX model right up to the DX4-75. And our DX2-50 model recently won *PC World's* Best Buy award in the Power Moblile PC category.

All Gateway ColorBooks are based on the Intel® SL Enhanced 486 processor with enough power and memory to run all your Windows applications. Weighing less than 5.7 pounds, measuring 1.77-inches thin, all models include two PCMCIA Type II or one Type III slots, excellent battery life, carrying case and a great suspend/resume feature. Our DX2 and DX4 models also include PCMCIA fax/modems. You also get Microsoft Works™ or MS Office Professional standard.

No, it's not an illusion ... it's the ColorBook from Gateway 2000.

GATEWAY2000 HANDBOOK 486

Visualize the ideal portable experience. On the road to enlightenment you'd like to have a lightweight, compact, real 486 PC at an uncommonly low price. The Gateway 2000 HandBook® 486 is so extraordinary, it's portable computing utopia! With unbelievable prices on all HandBook models (they start at just $999!) there's never been a better time to indulge yourself in a world of 486 power that you can take anywhere.

The HandBook's slight frame — weighing less than three pounds and measuring roughly 10 x 6 inches — makes it an enchanting little PC. The HandBook DX2-50 gives you more MIPs per pound than any other portable PC. With Microsoft Office Professional included, the DX2-50 is an unbeatable value. And at these prices you can get the HandBook as a companion to your desktop system.

The HandBook's features are astounding. It has a bright, backlit VGA screen and a comfortable, touch-type keyboard along with an external diskette drive and leather carrying case. With two batteries included, the HandBook also lets you "hot swap" — change batteries or peripheral while the PC is running without rebooting the system or losing data.

All Gateway ColorBook and HandBook portable PCs come with a standard one-year limited parts warranty. A special VIP warranty is available only at the time of purchase for an additional $100.

You Can Have It All!

The Gateway 2000 Family PC

There's no place like home when you have a Gateway 2000® Family PC™ in the house. Every member of your family will be swept away as they discover inspiration, entertainment and learning experiences.

This fully equipped multimedia system takes you to a whole new dimension. You get a fast CD-ROM drive to run the best programs and games with sound, pictures, animation and video. With its high-quality sound card and speakers, the Family PC lets you play music CDs, hear audio clips or record audio — all with magical stereo sound.

The Family PC's fax/modem has all the communication software you need to access information and other computer users from all over the world through on-line services.

Experience a virtual software playground with Microsoft Works™ Multimedia Edition, MS Encarta 1994 Multimedia Encyclopedia, MS Money,™ **new** MS Complete Baseball, MS Golf, and Corel Professional Photos CD Sampler.

You won't find another home PC more loaded than the Gateway Family PCs and our Pentium-based multimedia systems — in any land.

3-Year Warranty

Gateway desktop systems come with one of the strongest warranties in the industry. All Gateway 2000 desktop PCs are backed by a three-year limited warranty on parts. The new three-year limited parts warranty includes Gateway monitors.

Gateway customers also receive a 30-day money-back guarantee and toll-free technical support. And *PC Magazine* readers recently honored us, for the fourth consecutive time, with their highest rating in *PC Mag's* Service and Reliability survey.

On-site service is available during the first year in most U.S. locations and may be provided without charge if our technicians determine it necessary.

For details on our new warranty and all of our service and support policies, please call or write for a free written copy.

Payment Options

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. You can also apply for the Gateway 2000 DuoLine™ MasterCard® Card, issued by Dial National Bank, Des Moines, Iowa.

To Other Worlds

Gateway 2000 customers in Canada and Puerto Rico receive toll-free telephone service in both countries (see the back page of this ad for special 800 numbers) along with award-winning technical support and CSA approvals. On-site service is available in some Canadian and Puerto Rican locations, and our international shipping rates are among the most competitive in the industry.

GATEWAY2000

"You've got a friend in the business."®

8 0 0 - 8 4 6 - 2 0 6 5

GATEWAY2000 FamilyPC

intel inside

A Gateway 2000 Family PC is your doorway to new worlds.

Printed on recycled paper with soy inks.

Gateway 2000 is a corporate sponsor of GLOBAL REOLEAF

Energy EPA POLLUTION PREVENTER

Multimedia Systems

4SX-33 FAMILY PC™

- Intel® 33MHz 486SX CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS® 6.2 & WFW 3.11
- MS Works,™ Encarta, Baseball, Money,™ & Golf
- 3-Year Limited Parts Warranty

$1499

4DX2-66 FAMILY PC

- Intel 66MHz 486DX2 CPU*
- 8MB RAM, 128KB Cache
- 420MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Yamaha® Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Works, Encarta, Baseball, Money, & Golf
- 3-Year Limited Parts Warranty

$1999

P5-60 BEST BUY

- Intel 60MHz Pentium™ CPU*
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Yamaha Speakers
- TelePath™ II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Color CrystalScan® Monitor
- Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2499

P5-90 BEST BUY

- Intel 90MHz Pentium CPU*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Yamaha Speakers
- TelePath II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey® Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2999

Professional Systems

4SX-33

- Intel 33MHz 486SX CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Works 3.0 CD
- 3-Year Limited Parts Warranty

4SX-33 $1299
4DX2-66 $1599
(w/ 540MB Hard Drive)

P4D-66

- Intel 66MHz 486DX2 CPU*
- 8MB RAM, 128KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2199

P5-60

- Intel 60MHz Pentium CPU*
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2299

P5-90 XL

- Intel 90MHz Pentium CPU*
- 16MB RAM, 256KB Cache
- 1 GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- ATI Mach 64 with 2MB VRAM
- Double-Speed CD-ROM
- 16-Bit Wavetable Sound Card & Altec ACS-31 Speakers
- 3.5" Diskette Drive
- 17" Color CrystalScan 1776LE
- Tower Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$3999

Portables

HANDBOOK® 486

- 2.94 Lbs., 9.75" x 5.9" x 1.6"
- SL Enhanced Intel 486 or DX2 Processor
- 4MB or 8MB RAM (expandable to 20MB)
- 80 to 250MB IDE Hard Drive
- External 3.5" Diskette Drive
- 7.9" Backlit VGA Display
- 2 NiMH Batteries & AC Pack
- Suspend/Resume Feature
- 1 PCMCIA Type II Slot
- EZ Point™ Integrated Pointer
- 78-Key Keyboard
- Parallel, Serial & PS/2® Ports
- Leather Carrying Case
- MS Works for Windows 3.0 or MS Office Professional
- MS-DOS 6.2, WFW 3.11 & Serial Transfer Cable

HANDBOOK 486SX-25
4MB RAM, 80MB Hard Drive, Works
$999

HANDBOOK DX2-40
8MB RAM, 130MB Hard Drive, Works
$1499

HANDBOOK DX2-50
8MB RAM, 250MB Hard Drive, MS Office Professional
$2499

COLORBOOK™

- 5.7 Lbs., 11.7" x 8.5" x 1.77"
- SL Enhanced Intel 486, DX2 or DX4 Processor
- 4MB or 8MB RAM (expandable to 20MB)
- 3.5" Diskette Drive and Removable 250MB IDE Drive
- 10.3" or 9.4" VGA Dual-Scan STN Color Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots (1 Type III)
- Integrated Trackball (2 buttons)
- 85-Key Keyboard
- Parallel, Serial, PS/2 & VGA Ports
- MS Works or Office Professional
- MS-DOS 6.2 & WFW 3.11

COLORBOOK 486SX-33
4MB RAM, Case, Works
$1999

COLORBOOK DX2-40
4MB RAM, Fax/Modem, Case, Works
$2699

COLORBOOK DX2-50
8MB RAM, Fax/Modem, Case, Office Professional
$3199

COLORBOOK DX4-75
8MB RAM, TelePath Fax/Modem, Case Office Professional
$3699

Toll free from Canada
800-846-3609

Toll free from Puerto Rico
800-846-3613

GATEWAY2000
"You've got a friend in the business."®

8 0 0 - 8 4 6 - 2 0 6 5

*Intel Verified: Upgradable

intel inside®

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 605-232-2561
Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

Extraordinary Extras!

A wonderland of value: Gateway 2000's peripherals and software, sold only with the purchase of a system.

MULTIMEDIA

Basic Audio Multimedia Kit

Here's everything you need to add multimedia to a Gateway PC.

- Gateway 2000 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with MIDI/game port, mic in, stereo line in/out
- 2 Labtec® CS-180 speakers

$109 *(with system purchase)*

Wavetable Audio Multimedia Kit

Once you've heard wavetable audio, basic audio will never do!

- Ensoniq® Soundscape™ 16-bit wavetable sound card, MT-32 and FM mode compatible. Supports most software for popular sound cards and standards including General MIDI, Sound Blaster, AdLib, Roland MPU 401, MS Windows Sound Sytem and MT 32
- New Altec Lansing ACS-31 three-piece speaker system
- MidiSoft® Sound Explorer and Time Warner's Aegis™ software

$249 *(with system purchase)*

Altec Lansing ACS-31 Speakers

A Gateway exclusive from Altec Lansing: a three-piece speaker set at a two-piece price. Two 3-inch free-standing speakers crank out up to five watts per channel while the subwoofer can deliver 15 watts of heart-pounding bass. **$119**

Multimedia Software Starter Pack

You get nearly $700 worth of software for less than $100! Package includes Cinemania '94, Mad Dog McCree, Tuneland, Mayo Clinic Family Health Book, Better Homes and Gardens Cookbook, The Lawnmower Man, Sitting on the Farm, Mavis Beacon Teaches Typing, Chess Master 3000, U.S. Atlas and World Atlas. You also get a compact disc cleaner and 20-disk storage rack. **$129**

MONITORS

CrystalScan® 17-Inch Monitor

Non-interlaced color monitor with intelligent multi-scanning analog color display capable of 1280 x 1024 resolutionin non-interlaced mode, .26 dot pitch.
Upgrade from a 14-inch CrystalScan 1024NI monitor **$395**
Upgrade from a 15-inch CrystalScan 1572 monitor **$335**
(Prices good only for upgrades at the time of system purchase.)

COMMUNICATIONS & STORAGE

TelePath™ II Fax/Modem

Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. Includes CommWorks™ data and fax communication software, CoSession™ Host remote diagnostics, plus a CompuServe® trial membership. **$99**

Colorado Memory Systems® TBU

250MB internal tape backup unit copies up to 9.5MB per minute. Comes with MS Windows™ and DOS software, one tape and cable. **$149**

PRINTERS

Hewlett®-Packard 4L LaserJet Printer

A full-featured 300dpi printer loaded with enhanced PCL 5 and 26 scaleable typefaces with 1MB standard HP Memory Enhancement Technology. Parallel cable included. **$699**

Hewlett-Packard 4L LaserJet Printer

A 600dpi printer for four times the dots of 300dpi laser printing with enhanced PCL 5 and 45 scalable typefaces. 2MB standard memory and 3 universal SIMM slots available for additional memory or PostScript fonts. Parallel cable included. **$999**

Epson® Stylus™ 800 Ink Jet Printer

Get the look of a laser at a dot matrix price with the Stylus 800. Prints 150 characters per second at 360dpi — fast and quiet! **$289**

*Call for other printer options, including more **Hewlett-Packard** printers.*

NETWORKING

Ethernet Adapter from 3Com®

Ultra high-performance 16-bit Ethernet cards from the world leaders in Ethernet technology.
16-bit Triple Media Card supports BNC, AUI and Twisted Pair media **$119**
16-bit Twisted Pair only **$99**

Token Ring

IBM® 16-bit Token Ring card **$429**

PORTABLES

Peripherals and upgrades available only with a Gateway portable purchase.

PCMCIA Cards

- TelePath 14,400 Fax/Modem. **$249** *(Also in XJACK® version, same price)*
- 9,600/2,400 Fax/Modem. **$149**
- Ethernet adapter. **$149**
- Token Ring adapter. **$449**
- HandBook® VGA adapter. **$229**

Other Accessories

- 2.2Ah NiMH batteries. *Call for prices*
- HandBook 3.5" external floppy. **$99**
- ColorBook™ carrying case. **$49**
- HandBook leather carrying case. **$55**
- Extended VIP warranty — we ship a replacement to you within 24 hours during warranty. Point of sale only. **$100**

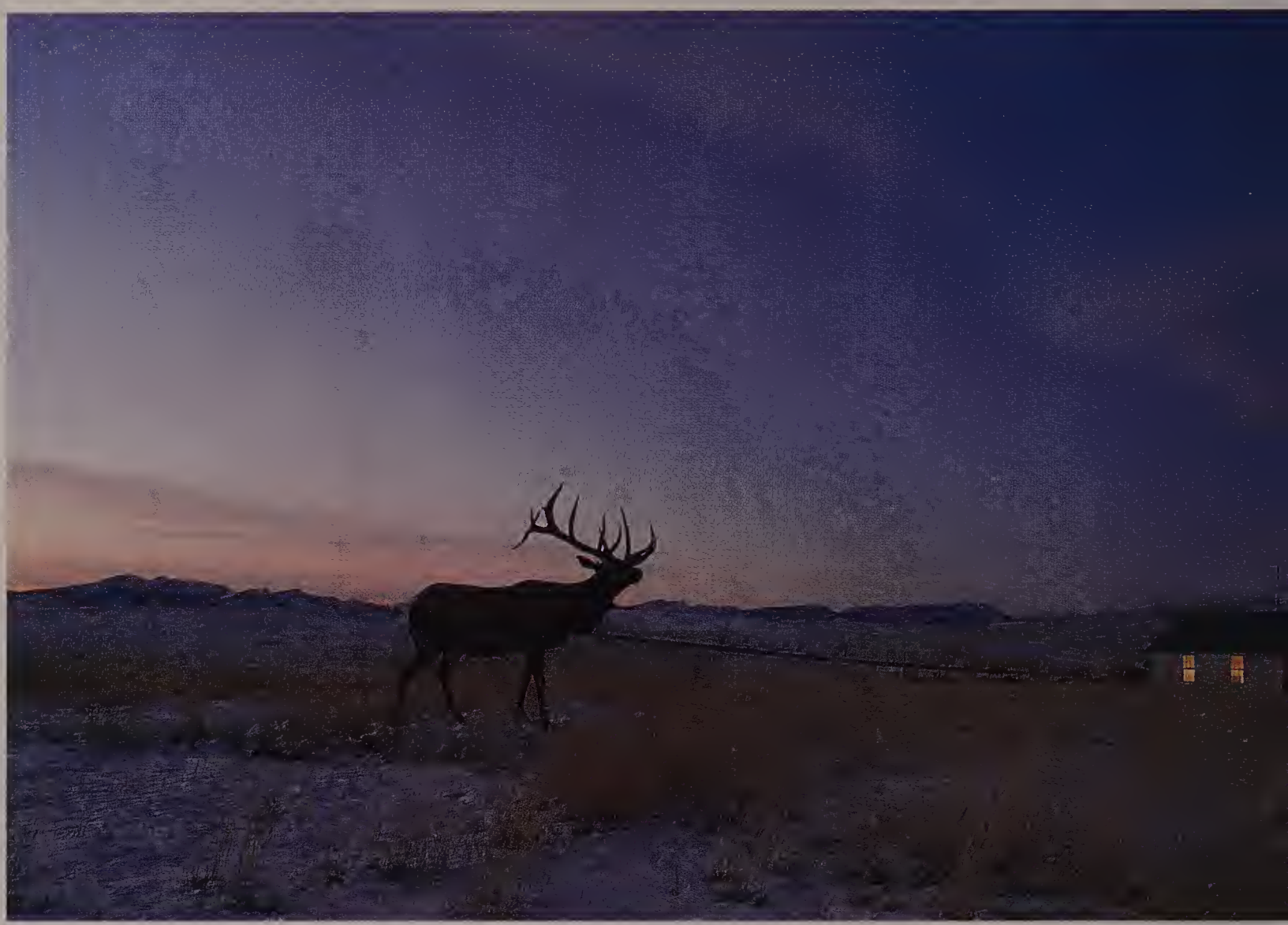
Call the Gateway 2000 special Component Add-ons division at 800-846-2080 for our complete line of extras for Gateway customers.

GATEWAY2000

"You've got a friend in the business."®

800-846-2065

© 1994 Gateway 2000, Inc. Gateway 2000, AnyKey, CrystalScan, HandBook, black-and-white spot design, "G" logo and "You've got a friend in the business" slogan are registered trademarks, and ColorBook, DuoLine, Family PC, EZ Point and TelePath are trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel, Pentium and OverDrive are trademarks or registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Monitors' diagonal measurements indicate the size of the cathode-ray tube. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping or applicable sales tax.



When a bug showed up in a new program, the first to know was a guy in Montana. And everyone on CompuServe.

Why settle for always being the last to know when you can be among the first with a CompuServe membership? We put an entire world of up-to-the-minute information right at your fingertips.

Our online, interactive hardware and software support forums can put you in touch with thousands of experts. Even the authors of new and popular software programs.

Whether you're a novice or an expert, there's someone out there who can help you with your specific problems and concerns. Or keep you on top of the latest developments.

There are libraries of software available for each hardware and software forum that you can download for free as a CompuServe member.

And there are forums that can offer you help on just about everything: cameras, pets, model building, scuba gear—you name it.

So get CompuServe today. See your computer dealer, or call 1 800 848-8199, for more information or to order. Outside the United States, call 1 614 529-1349.

CompuServe®

The information service you won't outgrow.™

Circle 33 on reader service card

New AST Lineup: Faster Processors and Video

AST Research has strengthened its PC offerings with new lines of notebooks, budget desktops, and high-end Pentium workstations.

Powerful Portables

The top-of-the-line Ascentia 900N replaces AST's highly touted PowerExec family of premium portables. With a traveling weight of 8.2 pounds, the 900N is available with either a 75-MHz DX4 or a 50-MHz 486DX2 processor. The DX4 PC we evaluated was one of the fastest we've tested in this class. And battery life was excellent, at 6 hours and 44 minutes.

The new line comes with some of the largest displays currently offered on notebooks. Screen options, which vary according to system, include 10.3-inch dual scan, 9.5-inch active matrix, and 10.4-inch active matrix. Complete with local bus video (16-bit on the dual-scan unit and 32-bit on the active-matrix systems), the 900N would make an ideal presentation system, offering crisper colors and smoother video playback than previous AST portables, the vendor claims. On the downside, the unit does not include built-in sound, as do some competitors' presentation-quality machines.

A 75-MHz DX4 with 8MB of RAM, a 510MB removable hard drive, and a 10.4-inch active-matrix screen costs $5949.

The lower-end 800N products replace the company's Bravo NB line. The 800N is available with either a 33-MHz 486SX or a 50-MHz 486DX2 CPU and a 9.5-inch dual-scan display. A base model street priced at $2300 includes 4MB of RAM expandable to 20MB, a 250MB hard drive, and two PCMCIA Type II slots. You can swap the 1.44MB floppy drive for a second battery.

On the Desktop

For budget-conscious PC buyers, AST has enhanced its existing Bravo line with the Bravo MS. This new line offers a number of improvements, including Plug and Play functionality and PCI local bus graphics. Processor options cover the performance spectrum, from a 33-MHz 486DX to a 100-MHz Pentium. All systems include an upgrade socket for some variation of the Intel Pentium OverDrive chip.

AST has also boosted the graphics capability in its new Bravos with a 64-bit subsystem. Based on a Cirrus Logic PCI local bus graphics controller, it displays 256 colors at 1024 by 768 noninterlaced resolution. AST claims graphics performance is three times faster than it was on the Bravo LC.

GOING MOBILE: AST'S ASCENTIA 900N comes preloaded with all the communications software you need to stay connected on the road.

However, the $2450 MS 4/66d that we tested performed about average for a 66-MHz 486DX2. For those with larger budgets and more demanding applications, AST offers the Premmia GX and MX systems, which give the company's high-end LX family Plug and Play functionality, 64-bit graphics, and an optional Type III PCMCIA slot. The slot, front mounted for accessibility, lets you easily share peripherals with other compatible systems.

The lower end of the two lines, the MX family, includes systems based on Intel's 66-MHz 486DX2, 100-MHz DX4, and 60-MHz Pentium CPUs. The GX line consists of 90- and 100-MHz Pentium systems, each with a free socket available for dual processing, an integrated ethernet controller, and a FastSCSI-2 controller.

The MX models in both lines include two free PCI slots and four free 16-bit ISA slots; the GX models have one free PCI and five free EISA slots.

The Premmias sport a 64-bit ATI graphics card based on the Mach64 chip. The subsystem includes 2MB of VRAM expandable to 4MB and displays 64,000 colors at 1024 by 768 noninterlaced resolution.

Like the Bravo MS 4/66d, the Premmia system we tested was a mediocre performer. The $2900 Premmia MX 4/100t we examined included a 100-MHz DX4 CPU with 8MB of RAM and 256K of secondary cache. This price does not include a monitor.

—Caroline Jones

Ascentia 900N, 800N; Bravo MS; Premmia MX, Premmia GX

New AST products include high-end notebooks, budget desktops, and powerhouse workstations.

AST Research
800/876-4278
Street price without monitor: Ascentia $2300 to $5949, Bravo MS 4/66d $2450, Premmia $3000 to $4000
Reader service no. 775

Low-Cost Color Ink Jets Provide Options for Buyers on a Budget

With color ink jet printers selling for less than $600, now may be the ideal time to add color to your spreadsheets, reports, and presentations. But be careful: Not all color ink jets are great deals. In our informal tests, Epson's $699 Stylus Color produced terrific results, while Digital's $449 DECcolorwriter 520ic proved disappointing.

Epson's Stylus Color is a good choice for business documents. It prints text, graphics, and photos well. At press time this ink jet printer provided the highest resolution in its price range. The Epson delivers 360-by-360 and 720-by-720-dots-per-inch resolution (720 dpi works only with Windows applications and requires coated paper). The previous leader in this category, Hewlett-Packard's $719 DeskJet 560C, provides only 600 by 300 dpi.

With color ink jets, paper makes a huge difference in output quality. On copier paper, which typically is rated at 18 to 20 pounds, ink drops spread and text looks fuzzy. On 24-pound letterhead, output is acceptable. But you get the best results by using coated paper, which is pricey. Epson sells 200-sheet reams of coated paper for $21 for 360-dpi printing and $25 for 720 dpi.

(Ink is pricey as well: Print cartridges cost $17 for a monochrome cartridge, which lasts for 840 pages of standard, double-spaced text; and $35 for color, which lasts for 670 pages, says Epson.)

The Epson printer proved its printing prowess in tests. I printed a newsletter page, a page with a bar chart, and a page with a map, each on both plain and coated paper, at 360 dpi. On plain paper, the newsletter page looked acceptable, but on coated paper the text appeared crisper and the colors more vivid.

The map and bar chart looked good on plain paper, even better on coated paper. A sample bar chart also printed well on a transparency. Epson recommends that you use the 720-dpi mode (and its required coated paper) for scanned images. I printed a photo (a TIFF file), and it turned out bright and sharp.

Like most ink jet printers, the Epson is no speed demon: The device prints at 2 pages per minute for letter quality black and white, and you'll find yourself waiting about 3 minutes for a color page, according to the vendor.

QUALITY COLOR FOR LESS: Epson's Stylus Color ink jet printer delivers 360- and 720-dots-per-inch resolution for $699.

THE DECCOLORWRITER 520ic offers low-cost 300-dpi color, but print quality varies.

Low-Priced DEC

The DECcolorwriter 520ic, one of the least expensive color ink jets, is about $250 cheaper than the Epson. However, the tradeoff is apparent in the print quality. The DEC produces fuzzy text and doesn't do well with photos and transparencies. It would work acceptably for an occasional chart but not for the sort of critical documents you'd want to have on hand to impress clients.

DEC's ink jet prints at 300-by-300-dpi resolution, using swappable ink cartridges. You must remove the monochrome cartridge and snap in the color cartridge when you want to print color.

The DECcolorwriter's output quality was underwhelming. The manual recommends using 18-to-24-pound paper, but don't expect to use anything less than 24-pound.

Print quality on 20-pound copier paper was poor—the text was smudged. Even on 24-pound paper, the newsletter page's headline and text appeared fuzzy. Color output looked acceptable but not what you'd call sharp. The bar chart came out fine on 24-pound paper but didn't fare well on a transparency: Black text wasn't solid, and wavy lines showed in the colored columns. The photo printed grainy and dark both on the 24-pound paper and on coated paper.

As with the Epson, the DEC's speed is unimpressive. The device is rated to print at 2 ppm for a letter quality black-and-white page and at about 3 minutes for color.

Black ink cartridges cost about $6 apiece and last for about 400 pages. Color cartridges cost about $35 and last for about 200 pages.

—Laurianne McLaughlin

Epson Stylus Color

This 360-dpi ink jet is a good bet for pumping color into business documents.

Epson America

800/289-3776

List price: $699

DECcolorwriter 520ic

Digital's 300-dpi color ink jet offers inexpensive color, but print quality isn't good enough for business use.

DEC

800/777-4343

List price: $449

Reader service no. 776

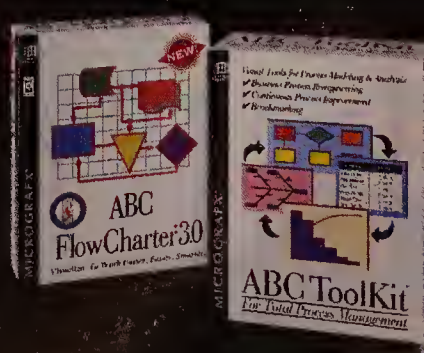
AMERICA'S BEST-RUN COMPANIES HAVE A SECRET WEAPON THEY DON'T WANT YOU TO KNOW ABOUT.

ABC ToolKit
For Total Process Management

(BUT WE DO.)

The best companies don't merely survive change, they *thrive* on it. They use it to gain advantage. ■ But how do they manage it? It's simple: ABC FlowCharter® and ABC ToolKit™. ● Together, these programs let you visualize and analyze *all* your business operations, no matter how complex. They quickly root out and prioritize inefficiencies. Then show you exactly what to *do* about them. ▲ Start by putting ABC FlowCharter, the best-selling Windows™ flowcharting software, in every work-group. And get ready for all the process maps, workflow documentation and systems diagrams you've been waiting for. ■ Then plug your flowcharts into ABC ToolKit and have your teams enter cycle times, cost and other important data. ToolKit analyzes your business using the seven essential tools of quality management, including Pareto charts, control charts and histograms. ● If your goals include **ISO 9000** certification, here's another little secret: You can use ABC FlowCharter to shave weeks off the process. ▲ When you call 1-800-454-7118, we'll let you in on a few more secrets, too. Like our *free* working model of ABC FlowCharter and special upgrade pricing. We'll even show you how other companies have profited from ABC. ■ But hurry, because he who holds the secret holds the advantage.

PC MAGAZINE EDITORS' CHOICE
Dec. 21, 1993



For a FREE working model, call 1-800-454-7118.

MicroGrafx™
THE FUTURE OF CREATIVITY

Copyright © 1994 Micrografx, Inc. All rights reserved. 214-234-1769. Offices in Dallas, London, Madrid, Milan, Munich, Paris, Sydney, Tokyo and Toronto.

Circle 183 on reader service card

Faster Chips, Better Screens Grace Toshiba's New Notebooks

Toshiba has refined its current crop of portable systems, adding superior color screens and faster processors, and including its innovative AccuPoint pointing device in more models. While more evolutionary than revolutionary, Toshiba's new portables provide more punch for your peso.

The Portégé T3600CT is Toshiba's coolest portable. This 4.4-pound subnote now features a larger 8.4-inch active-matrix color screen, a 250MB hard drive, and a 50-MHz 486DX2 processor. The Portégé runs 3 to 6 hours on its lithium-ion battery, Toshiba claims. The $4399 estimated street price is on the steep side, but for the traveling executive who wants a powerful PC for the office and the road, it's still well worth considering.

Toshiba's Satellite T2400C series of 7-pound notebooks incorporates one of the Portégé's most noteworthy features: the AccuPoint pointing device. It's similar to the pointer on IBM's ThinkPads and takes some getting used to.

The T2400CT has an 8.4-inch active-matrix color screen, 8MB of RAM, and a 250MB or 320MB hard drive. A 250MB system should sell for about $4099 on the street. The T2400CS, with an estimated street price of $3299, has a 9.5-inch passive color display, 4MB of RAM, and a 250MB hard drive. Each note features a 50-MHz 486DX2 chip.

Other features include two PCMCIA slots (one Type II and one Type III), and a SCSI-2 port for connecting external peripherals, such as CD ROM and tape drives.

At the low end, Toshiba's bargain Satellite T1960C notebooks also offer a 50-MHz 486DX2, and they feature Microsoft's clip-on BallPoint Mouse 2.0. The T1960CT features an 8.4-inch active-matrix color display, 4MB of RAM, and a 200MB or 320MB hard drive. Street prices should start at about $3399 for the 200MB unit. The T1960CS has a 9.5-inch passive color screen, 4MB of RAM, and a 200MB hard drive and should sell for $2699.

—Jeff Bertolucci

LITTLE PC, LOTTA POWER: Toshiba's 4.4-pound Portégé T3600CT features a 50-MHz 486DX2 CPU and an active-matrix color screen.

Portégé T3600CT, T2400CT, T2400CS, T1960CT, T1960CS

Toshiba's faster portables offer better color screens.
Toshiba America
800/334-3445
Street price: T3600CT $4399, T2400CT $4099, T2400CS $3299, T1960CT $3399, T1960CS $2699
Reader service no. 777

Dell Turns Up the Heat With Hot New Minitowers

Dell Computer has moved a step ahead of rival Compaq by introducing new minitowers, including a 90-MHz Pentium offering. At press time, Compaq's fastest system was powered by a 66-MHz Pentium chip.

The quickest of the new Dell Dimension XPS MT systems, the Pentium-90, sells for only $2649, less than some 60-MHz Pentium machines. These high-performance systems would be an ideal solution for a small office, but at prices this low, they're looking good for *any* environment.

The Dimension XPS MT minitower systems feature 8MB of RAM, a PCI local bus, a 64-bit local bus graphics adapter with 1MB of video RAM, a 256K second-level write-back cache, a 540MB hard drive, an Enhanced IDE drive adapter, a 3½-inch floppy, a 15-inch monitor, and a mouse.

Dell offers double- and triple-speed CD ROM drives as an option—and for peace of mind I recommend getting one factory installed.

As an option you can also get a high-performance #9GXE64 graphics accelerator board—which supports 16 million colors at high resolutions. DOS 6.21 and Windows 3.1 come preloaded.

Dell also introduced similar MT models in its Precision line, which is sold through outlets such as Best Buy, CompUSA, and Sam's Club. If you're going to buy a Dell, I recommend buying it direct, because the Precision models sometimes include hidden price-configuration trade-offs—such as a lower-resolution monitor.

In addition to the minitowers, the Austin, Texas, manufacturer has introduced two 100-MHz Pentium file servers. The PowerEdge SP 5100 is priced from $11,047, and the PowerEdge XE 5100 starts at $12,731.

—Joe Abernathy

Dell Dimension XPS MT

Dell's new high-performance, competitively priced minitower systems.
Dell Computer
800/289-3355
List price: $2149 to $2649, depending on processor
Reader service no. 778

Get answers *every day* a spreadsheet can't give you *any day*

Real Stats. Real Easy.

New Developer's Kit! Call today for details!

Use SPSS 6.1 for Windows when you need in-depth answers quickly and easily. Go beyond summary statistics and spreadsheet row-and-column math by using the right tool for the job. SPSS is a complete tool kit of statistics, graphs and reports that enables you to answer tough questions like:

- Why did sales drop in the last quarter?
- How satisfied are my customers?
- What are the patterns in my data?

SPSS products are used today for:

Survey research of all types
- Explore consumer awareness
- Compare perceptions of products
- Discover preferences by group

Marketing and sales analysis
- Analyze your customer database
- Forecast sales by product and region
- Improve mailing responses
- Learn which promotions work best

Quality improvement
- Assess process capability
- Reduce nonconformance
- Spot unnatural patterns of variation
- Track incidence of infection

Research of all types
- Test hypotheses
- Determine group differences
- Track performance over time
- Prepare professional reports

Answer your tough questions

You don't need a Ph.D. to learn or use SPSS 6.1 for Windows. A tutorial, task-oriented help and a glossary of statistical terms will help make you an expert. You'll be surprised at how easy it is to do in-depth data analysis.

And, if you are already an expert, you'll appreciate SPSS' rich set of statistical functionality. Whatever your experience level, you'll be able to explore your data thoroughly.

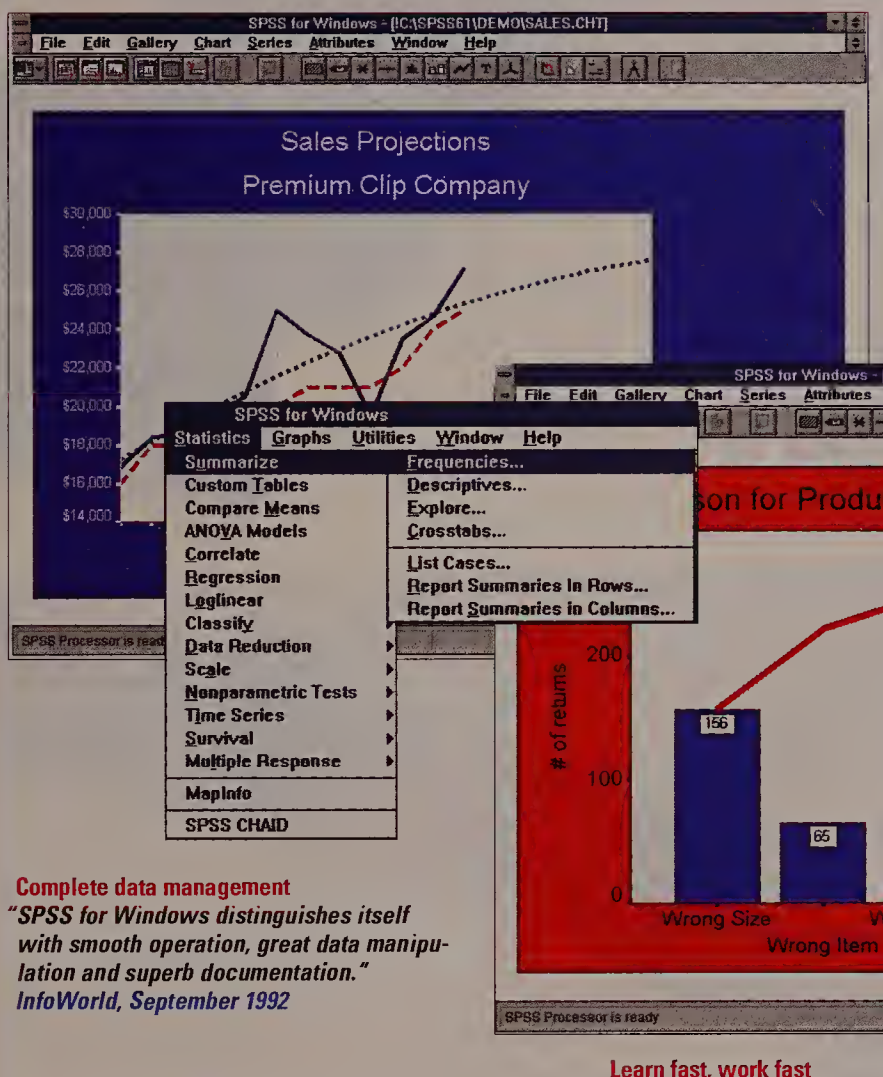
Discover hidden patterns and trends in your data with over 50 high-resolution business, analytical and SQC charts. SPSS saves you time by automatically aggregating your data and labeling your charts. Then, quickly add smoothing lines, confidence intervals and more to tell the full story in your data.

Call today to find out how to answer your tough questions every day with SPSS 6.1 for Windows!

Get a great value – order now!

Call (800) 543-5837

or Fax (800) 841-0064



In-depth statistics

"For more statistical analysis tools than you'll get from a spreadsheet such as Excel, without the steep learning curve, SPSS for Windows is a great buy."
PC/Computing, August 1992

PC MAGAZINE EDITORS' CHOICE
May 11, 1993
SPSS 5.0/Windows

Complete data management

"SPSS for Windows distinguishes itself with smooth operation, great data manipulation and superb documentation."
InfoWorld, September 1992

Automatic statistical graphs

"A complete set of graphics and charting capabilities." PC Week, May 1992

Learn fast, work fast

"SPSS for Windows is an excellent full-featured set of statistical procedures...The Windows interface makes it easy and fast to use and I highly recommend it." Marketing Research, Summer 1993

Reasons SPSS 6.1 for Windows goes beyond your spreadsheet:

- 60+ statistical procedures
- 50+ business, analytical and SQC charts with automatic labels
- New toolbar which gives you one-button access to statistics and commonly used functions
- Technical support for statistical help
- New online tutorial
- Statistical help system
- Glossary of statistical terms
- Fast 32-bit processing
- Hot buttons between graphs and tables
- Work with even your largest data sets
- Complete report writer

- View your data as words, while doing analysis with numbers
- Keep your formulas safe and separate from your data
- ODBC / OLE
- Statistics located in easy-to-understand menus and dialog boxes
- Easy, complete data editing and management in a spreadsheet-like format
- Documentation which clearly explains statistics
- Create charts with your analysis automatically
- Automatic labeling of results

Available add-on modules:

- Explore your data more thoroughly with techniques such as factor, cluster, discriminant analysis and much more with SPSS Professional Statistics™
- Execute advanced multivariate techniques such as Cox regression, Kaplan-Meier estimation, logistic regression and more using SPSS Advanced Statistics™
- Create camera-ready tabular reports with SPSS Tables™

- Predict the future using advanced time-series analysis in SPSS Trends™
- Perform perceptual mapping, conjoint analysis and optimal scaling procedures with SPSS Categories®
- Find predictors and build better models using SPSS CHAID™
- Analyze linear structural equations and simultaneous equation models using SPSS LISREL 7™

- Improve your operations with statistical process control using QI Analyst™
- Build thematic maps with MapInfo®
- Plug components for stats, graphs and reports, complete with data management and output formatting, into your applications quickly and easily using OLE 2.0 Automation in the new SPSS Developer's Kit™ Provide both push-button statistical reports and interactive data analysis with access to all SPSS features

Microsoft Windows Compatible

Buyers Assurance Seal

yes it runs with NetWare

Get a great value – order now!

Call (800) 543-5837

or Fax (800) 841-0064

or mail to: SPSS Inc.
444 North Michigan Avenue
Chicago, IL 60611

American Express, Discover, MasterCard and VISA accepted

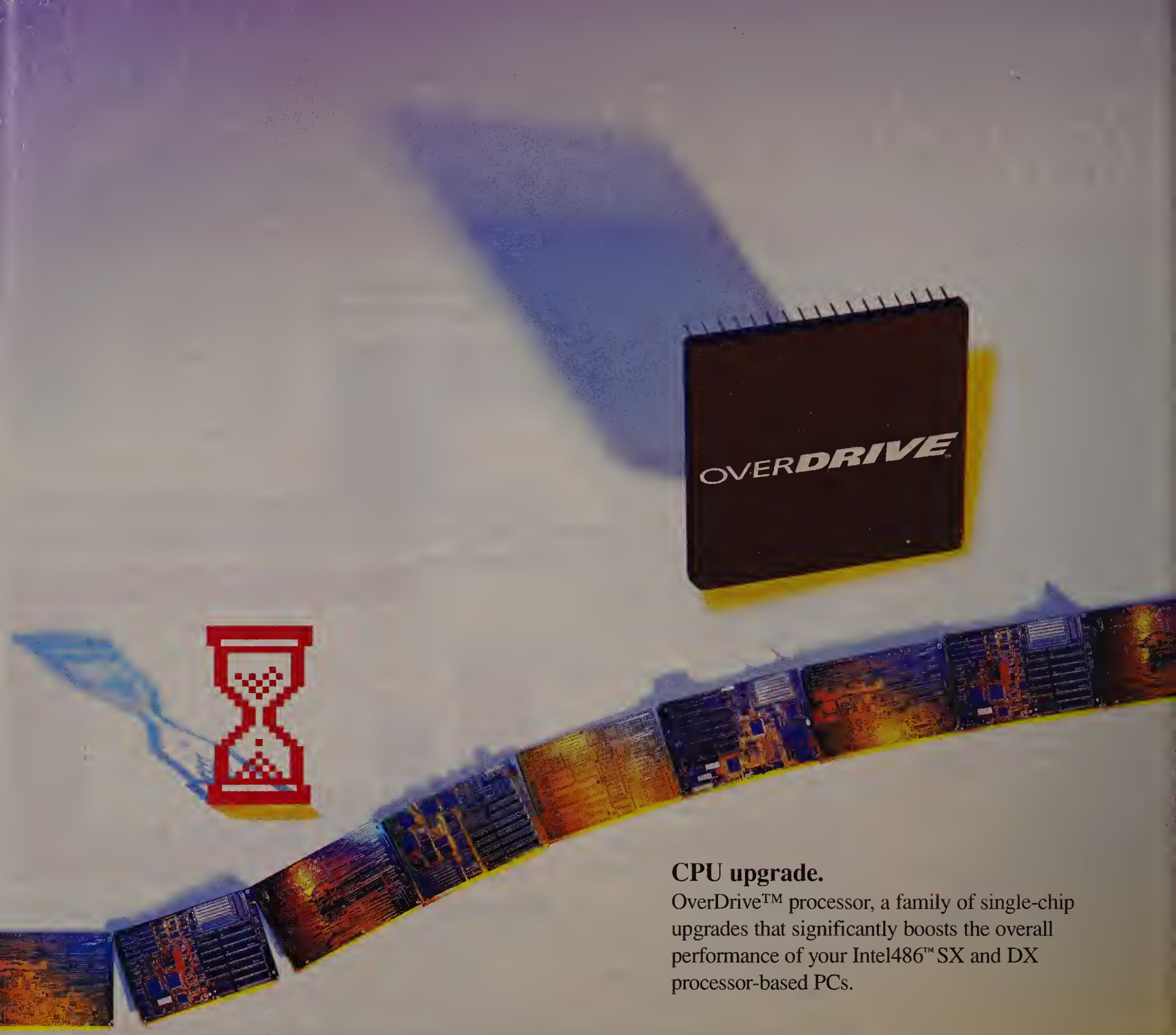
Name _____
Title _____
Organization _____
Address _____
City _____ State _____
ZIP _____ email _____
Phone Number ( ) _____
FAX Number ( ) _____

Try SPSS 6.1 for Windows with our unconditional 60-day money-back guarantee

SPSS
Real Stats. Real Easy.

Chicago · Washington, DC · Boulogne · Chertsey · Gorinchem · Madrid · Munich · New Delhi · Singapore · Stockholm · Sydney · Tokyo · And Distributors Worldwide.

Circle 253 on reader service card

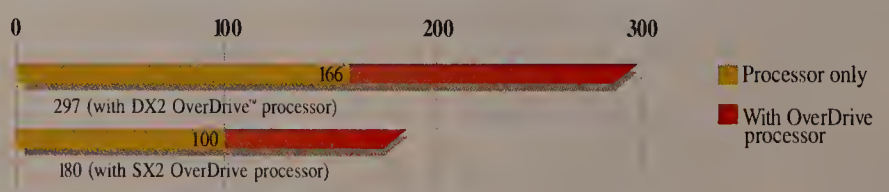


CPU upgrade.
OverDrive™ processor, a family of single-chip upgrades that significantly boosts the overall performance of your Intel486™ SX and DX processor-based PCs.

Slow performance.
Your software is bogged down, but you can't buy a new PC right now.

To speed up your 486

OverDrive™ Processor iCOMP™ Performance Index for Intel Inside® Processors



Free OverDrive™ processor demo disk.

To see how much faster your software runs with an OverDrive™ processor, call 1-800-538-3373, Ext. 178 for your free demo diskette. Or simply complete this card and drop it in the mail. Either way, it's the right path to take.

Please answer the following questions to help us better serve you. Thank you.

1. What Intel processor-based system(s) are you currently using?
   i486™SX____ i486™DX____ IntelSX2™/IntelDX2™____
   IntelDX4™____ Pentium™____

2. How many OverDrive processors are you or your company interested in purchasing?
   0____ 1-9____ 10-49____ 50+____

3. When are you interested in purchasing an OverDrive processor(s)?
   0-60 days____ 61-120 days____ 120+ days____

Name_____

Title_____

Company_____

Address_____

City _____State____Zip_____

Daytime Telephone #_____

For inquiries outside the U.S., affix proper postage. European residents may also call +44 (0) 793 431155, and ask for infopack IOD10.

ODBRC3 ©1994 Intel Corporation.

intel®

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
First Class Mail Permit No. 79 Portland, OR

Postage will be paid by addressee

intel®

PO Box 10266
Portland OR 97210-9879

Call 1-800-538-3373, ext. 178.†
To find out more about the IntelSX2™ and IntelDX2 OverDrive processors and to receive a free demo disk.

Speeds up software.
Microsoft Excel* 4.0 runs 83% faster and Microsoft Word* 2.0 65% faster when you upgrade a i486™ SX-33 processor with an IntelDX2™ 66 MHz OverDrive processor.

†For European residents, call +44 (0) 793 431155, and ask for infopack IOD10.
© 1994 Intel Corporation. *Other brands and names are the property of their respective owners.

follow the upgrade path.

OverDrive™ processor family of products

intel®

This Comfortable Keyboard Can Split, Swivel, or Tilt

If you're like most people, you use the keyboard that came with your system, but current research on repetitive-strain injuries suggests that the standard computer keyboard design does not promote comfortable typing. The Select-Ease from Lexmark looks like a typical keyboard, but it splits down the middle so you can adjust the device to your particular taste.

Using the knob that anchors the split halves, you can swivel either side away from the other or separate them entirely. Retractable legs allow you to adjust the height and angle of the keyboard as well.

I adjusted the keyboard so that it tilted up in the middle. I found typing more comfortable in this position.

Lexmark modified the standard keyboard layout only slightly for the Select-Ease: The <Print Screen>, <Scroll Lock>, and <Pause> keys moved above the function keys; and the <Insert>, <Delete>, <Home>, <End>, <Page Up>, and <Page Down> keys moved to the right corner.

Lexmark also added an inverted-T cursor key arrangement to the left side of the keyboard to accommodate southpaws. The <Space> bar on the left side of the split becomes an extra backspace key, called Erase-Eaze, which makes it easy to correct mistakes.

For $179, the Select-Ease is an inexpensive, easy way to make typing more comfortable.

—Melissa Riofrio

Select-Ease Keyboard

The split halves and retractable legs let you adjust the width, height, and angle of this keyboard for greater typing comfort.

Lexmark Int'l
800/438-2468
List price: $179
Reader service no. 779

KARATE-CHOPPED KEYBOARD: Lexmark's ergonomic Select-Ease Keyboard features a central knob to help you adjust the two halves.

ArtPad and PenMouse: Pen Tablets for the Masses

The pen-based tablets that are favored by artists and engineers have long been among the most intuitive of input devices, but they've been too bulky and pricey to lure many mainstream users. Now two new products from major tablet makers—Wacom's $199 ArtPad and Kurta's $249 PenMouse—bring the virtues of pen tablets to a wider audience.

Both units include a compact tablet, about the size of a mouse pad, that plugs into one of your computer's serial ports. You use a cordless pen as your input device; moving it around on the tablet surface causes the mouse pointer to follow along, and pressing it down is equivalent to clicking a mouse's left button. A button mounted on the pen barrel acts like a mouse's right button.

As you'd expect, the pen is a natural for paint programs and other graphics packages, but it's also a pleasing all-around mouse substitute. You can control the pen with great precision, which is helpful whether you're signing your name to a fax document or simply organizing the icons on your Windows desktop. Unlike Communications Intelligence Corporation's similar Handwriter tablet, neither of these devices focuses on handwriting recognition applications, although they're compatible with Microsoft's Pen Extensions for Windows and IBM's Pen DOS system software.

Both of these tablets are a pleasure to use, but I slightly preferred the overall ergonomics of the PenMouse. Its pen felt a bit more solid in my hand, and the pebbled tablet surface made the pen respond like a high-quality ballpoint pen. The surface of the preproduction ArtPad tablet I tested was smoother, which gave its pen a scratchy feeling.

In other respects, Wacom's ArtPad edges out its Kurta competitor. For example, while the active area of both of these tablets is almost identical, the ArtPad's overall size is smaller, making it a better choice for crowded desks. Its pen offers pressure sensitivity, which programs such as Fractal Design Painter use to simulate real-world art materials, like a chalk tool that lays down darker colors the more firmly you press. In addition, while the ArtPad worked with my mouse automatically, getting the PenMouse to do the same required some reconfiguring that was not explained in the manual.

The PenMouse is bundled with Fractal Design's Dabbler, a nifty paint program for amateur artists. At press time Wacom hadn't determined what software would be included with the ArtPad.

—Harry McCracken

ArtPad and PenMouse

Two pen tablets aimed at mainstream users.

ArtPad
Wacom
800/922-6613
List price: $199
Reader service no. 780

PenMouse
Kurta
800/445-8782
List price: $249
Reader service no. 781

REACH FOR THE STARS

SC-728SXL
17" Flat Screen
1,280 x 1,024 (60Hz) High Resolution
Mac Compatible

SC-528UXL
15" Flat Screen
1,280 x 1,024 (60Hz) High Resolution

SC-428UXL
14" 1,024 x 768 (75Hz) High Resolution

For generations, we have looked to the stars as symbols of that which cannot be reached. To be considered a star, one must display rare talent and ability to rise above the masses. While the average person may never literally reach the stars, it is possible to put one to ork for you. ★ Consider the Samtron StarPower™ line of high resolution monitors. Featuring igital controls, flicker-free screens to ease eye strain and non-interlaced displays for edge to edge ewing, the entire line complies with EPA Energy Star™ standards. ★ In addition, every amtron monitor comes with an unparalleled two year parts and three year labor warranty, lding up to heavenly performance at down-to-earth rices. ★ Contact your local dealer about the StarPower ne. You won't even need a telescope to see them up close.

SAMTRON®
MONITORS WITH STARPOWER™

The StarPower Line Features:

- *Super Fine Dot Pitch*
- *Low Emission, MPR II*
- *VGA, SVGA, XGA, VESA Compatible*
- *Multi-Scan*
- *Power Saving*

energy
EPA POLLUTION PREVENTER

SAMTRON DISPLAYS, INC.
14251 E. Firestone Blvd. #101 La Mirada, CA 90638
Tel: 310 802-8425 Fax: 310 802-8820
Customer Service: Tel: (800) SAMTRON.
Distributors: Canada, Tel: (416) 858-3000
Mexico, Tel: 011-525-325-0993

EPA Energy Star™ emblam does not represent EPA endorsement of eny product or service. Specifications subject to change without notice. VGA is a trademark of Internationel Business Machines Co., Ltd. Screen is simulated.

Circle 213 on reader service card

He Grew Up With MTV. H
And, Unfortunately, He'll

Gets 300 Cable Channels.
e In Your Audience Today.

Introducing Z·NOTEFLEX™, The Ultimate Multimedia Presenter.

Audience attention spans are short. And if they snooze, you lose.

So what you need is a way to make your presentations really worth watching. A way like the Z-NOTEFLEX system, from Zenith Data Systems.

With the Z-NOTEFLEX system, you get the capabilities of a multimedia workstation built around a powerful notebook computer that you can carry in your hand.

Inside, its high-speed Intel 486 processor and fast local bus deliver sharp, colorful images and full-motion video certain to get attention. Particularly when the LCD display is detached and positioned in your viewers' direction.*

Of course, no multimedia-ready system would be complete without a CD-ROM drive.** And the built-in, 16-bit audio, microphone and stereo speakers make the Z-NOTEFLEX system truly a sound investment.

Z-NOTEFLEX
up to
IntelDX4™ 75MHz processor
16-bit business audio
active-matrix, 256-color
LCD display

FLEXSITE
LCD display stand

FLEXBAY
battery charging bay
floppy drive bay

FLEXDOCK
enhanced port replicator
two type-III PCMCIA slots
networking module

FLEXSHOW†
double-speed CD-ROM drive
amplified stereo speakers
two type-III PCMCIA slots
integrated power supply

The Z-NOTEFLEX is modular, too. Its processor, memory, drives and display are all user-upgradable. Optional FLEX modules and PCMCIA slots support a wide range of system enhancements, multimedia capabilities and peripheral solutions.

You simply order the features you want today, then add others later as the need arises.

No other notebook makes it so easy to connect—with co-workers, with customers, in the office, or out in the field. But that's what people are learning to expect from ZDS.

intel inside

MPC2℠ Multimedia PC

To see what you can expect from the Z-NOTEFLEX, call us. Your audience will thank you.

1-800-374-4890, Ext. 5120

ZENITH DATA SYSTEMS

MAKE THE CONNECTION™

Copyright © 1994 Zenith Data Systems Corporation. Zenith Data Systems Corporation is a Bull company. Z-NOTEFLEX, ZDS and "Make The Connection" are trademarks of Zenith Data Systems Corporation. MPC2 certification mark is owned by the Multimedia PC Marketing Council, Inc. IntelDX4 is a trademark and the Intel Inside logo is a registered trademark of Intel Corporation. *With the optional FLEXSITE video stand **CD-ROM available in FLEXSHOW component only †FLEXSHOW unit requires AC power. Specifications are subject to change.

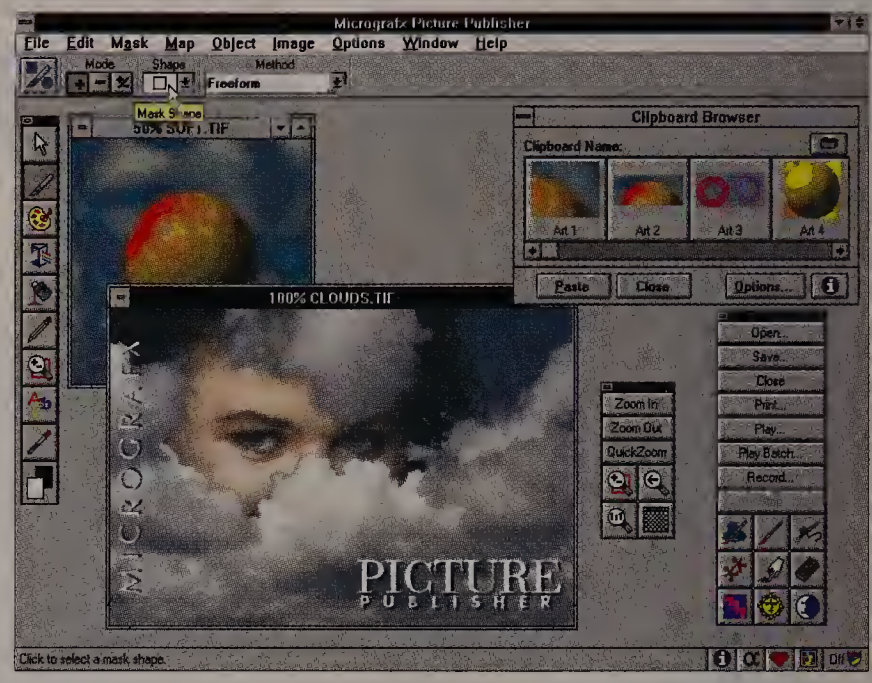
Circle 192 on reader service card

Photoshop 3.0 and Picture Publisher 5.0: Imaging Powerhouses

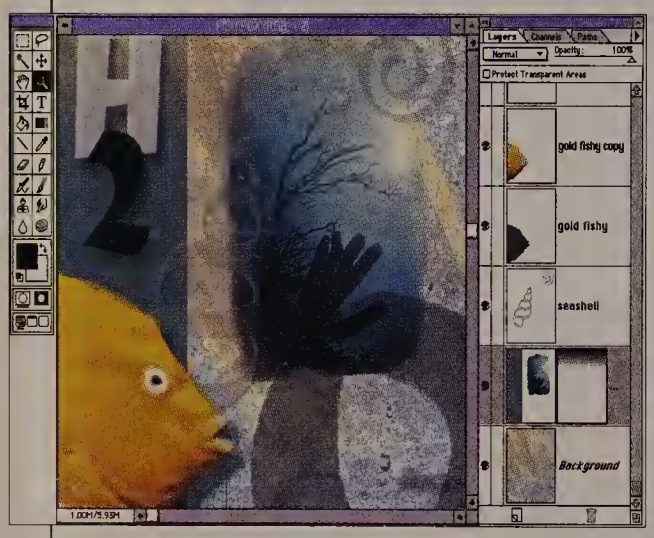
If a picture is worth a thousand words, then major upgrades of Adobe Photoshop and Micrografx Picture Publisher speak volumes. Both of these imaging programs offer intuitive new interfaces that make powerful imaging techniques quick and easy.

For starters, the $895 Adobe Photoshop 3.0 offers *object layering*. What's that? Think of it as composing a paper collage digitally. In earlier Photoshop versions, once you pasted an image on a background image, the two were stuck together like glue. Object layering lets you float multiple images above the background without pasting them, allowing you to rearrange the images later. You can save this composition in layered form (for future editing), or drop the new images onto the background and save the file as a normal Photoshop image. A popularity means more people will discover this feature.

In fact, the $595 Picture Publisher already offers object layering, and version 5.0 goes one step further with a new technique called *virtual imaging*. Imagine the time you'd save if you could easily edit that giant 100MB image of your company poster. Now you can—and on a 486 PC with only 8MB of RAM. Instead of opening the high-resolution image, you work on an identical *proxy* image at your screen's resolution—the proxy uses less RAM and is faster to edit. Since Picture Publisher 5.0 automatically records your editing session to an ASCII script, you can undo any mistake you make by removing it from the script. When you've finished editing, you can apply the changes to the original image. Another option is to send a copy of the original image and the ASCII file to a printing service bureau, which can incorporate all your changes and print the image (provided that the bureau uses version 5.0).



PICTURE PUBLISHER 5.0's new virtual imaging technique lets you edit huge graphics files in real time on slower PCs.



CREATIVE WHIMS ALLOWED: Alter images with Photoshop's mask layering palette.

Layering Palette shows thumbnails of each image layer—useful for drag-and-drop editing. Photoshop's special effects let you alter individual images or groups of images, then undo all your changes. While object layering isn't the latest image-editing trend, Photoshop's huge

True Colors

Color is Photoshop's strength. The four-color (CMYK) Print Preview feature in version 3.0 can help you identify color printing trouble spots. To achieve the best printing results, use the new Sponge Tool to lighten or add color to specific areas.

Both products have impressive color editing tools: Picture Publisher's Chroma Mask and Photoshop's Color Range let you select individual colors for on-the-fly masking, alteration, or replacement.

Getting to Know You

The nice thing about Photoshop is that users rarely have to relearn old tricks with each upgrade. The program's new floating menus make it easier to find the tools you need—and they roll up like window shades to free the screen of clutter. Another cool tool is the Command Palette, which you can customize to hold all your favorite commands. Filters with intriguing names such as Dust, Scratches, and Mezzotint help simplify photo retouching and color manipulation. And Photoshop's Lighting Tool casts simulated gallery lights on the surface of any image.

Picture Publisher has some enhancements for power users. You can modify the program's toolboxes to replace default commands with more advanced ones and record your favorite imaging tricks as macros. The Clipboard Browser, like Photoshop's Layering Palette, now lets you see small objects you can drag over the main image.

Both programs pack more features in the new versions, but Picture Publisher's virtual editing ability gives it the performance edge. The products each include an image library and tutorial on CD ROM, but Adobe throws in Acrobat Reader, several third-party filters, and a second CD ROM of fonts.

—John Goddard

Photoshop 3.0, Picture Publisher 5.0

Major upgrades of two popular imaging programs.

Photoshop 3.0
Adobe Systems
800/833-6687
List price: $895, upgrade $149
Reader service no. 712

Picture Publisher 5.0
Micrografx
800/326-3614
List price: $595, upgrade $149
Reader service no. 713

Peachtree Accounting 3.0 for Windows: Small-Business Bookkeeper

If you need to keep the books for a small business, Peachtree Accounting 3.0 for Windows is a superb choice. This latest release from the veteran developer of accounting software offers a broad range of accounting functions, together with a surprising degree of flexibility for such an inexpensive package.

Like most other small-business accounting software, such as Intuit's QuickBooks, the $169 Peachtree Accounting 3.0 handles all the basics. You get a general ledger for preparing financial statements, billing and accounts receivable for keeping tabs on your customers, and disbursements and accounts payable for tracking what you owe your suppliers.

Unlike QuickBooks, however, Peachtree also handles inventory. In addition, the package features a payroll system—something most manufacturers offer as an add-on module that costs extra.

One of Peachtree's most impressive facilities is the WYSIWYG report writer. You can take any of the 100-plus report templates and customize them to your heart's content. You can drag fields to different locations, modify the column widths, and change the fonts. You can even adjust the layout of checks to match the computer forms that you now use.

Like both MYOB and QuickBooks, Peachtree now includes business management tools, such as an events log that alerts you under certain conditions. For example, you might want Peachtree to remind you that you need to follow up on a customer's late payment.

As an alternative to the standard drop-down menus for Windows, you can activate a flowchart menu that displays the path of accounting transactions. You click on a flowchart icon to make quick changes at any stage of the accounting process. For example, let's say that your receivables flowchart shows all the customer-related accounting transactions. Just by clicking the flowchart icon, you can quickly create an invoice for a specific customer.

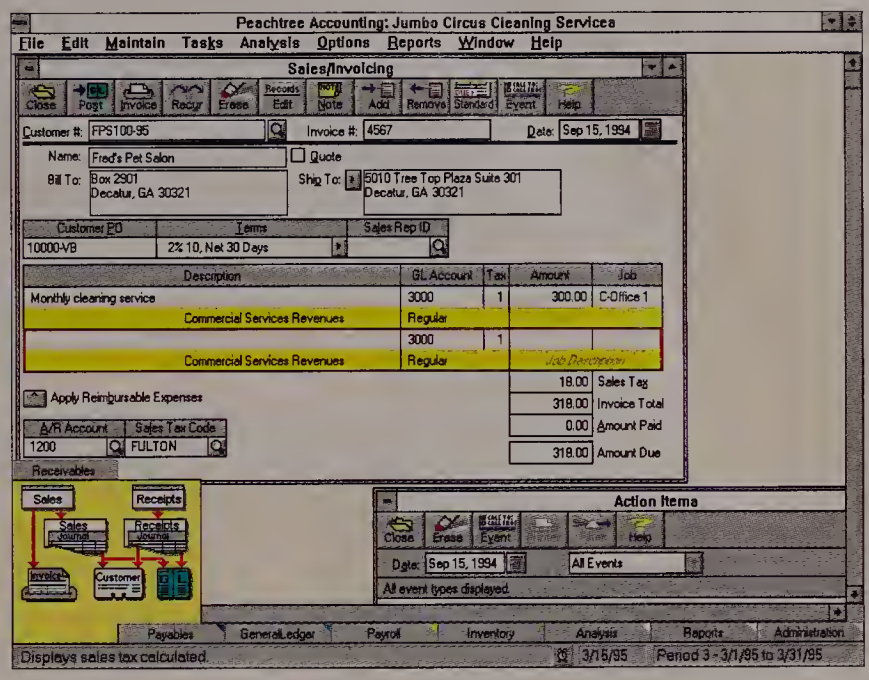
Peachtree keeps the books using either the standard accrual method or the simpler cash basis. Depending on your preference, the program can post transactions immediately or hold them in a batch for later posting. It can even unpost transactions up to two years old. Unposting is a great way for inexperienced users to correct errors, but it gives many auditors the heebie-jeebies because it destroys the audit trail. Access to this function can be restricted by a password control.

An added bonus: Peachtree is network ready, so you can continue to use the same program when your business grows and the books become too much for one person to handle.

—Richard Morochove

Peachtree Accounting 3.0 for Windows

Powerful bookkeeping software for small businesses.
Peachtree Software
800/247-3224, 404/564-5700
List price: $169 (floppy disk or CD ROM), upgrades $79; 60-day money-back guarantee
Reader service no. 714



PEACHTREE ACCOUNTING 3.0 FOR WINDOWS lets you prepare a quotation for a customer, then later convert it into an invoice.

NoMouse That Roars

If you think a mouse is more rodent than pointing device, NoMouse 5.0 for Windows is your pest control. The latest version of this mouse emulation software lets you control the cursor from the keyboard using cursor keys and customizable hot keys. And you can assign multiple hot keys to any NoMouse operation.

Convenient for laptop users who don't like the trackballs and pointing sticks that come with many portables, NoMouse 5.0 for Windows is also designed for keyboard-oriented desktop users.

NoMouse 5.0 offers improvements that let you control the cursor's speed and change its size and shape—great for hard-to-read laptop screens. You can also control the keyboard's simulation of a mouse's double-click. A new Shifted Speed function allows you to adjust the speed at which the cursor moves across the screen—particularly handy for graphics programs that require you to have great aim to edit an image.

Also added to NoMouse is a Screen Wrap function that lets the cursor move off one edge of the screen and reappear on the opposite side. This feature and the new Magnify and Snap-To functions are similar to features that are supplied by the latest Microsoft Mouse driver. The new version also provides an enhanced help file and installation program. NoMouse 5.0 for Windows lists for $49.95.

—Michael S. Lasky

NoMouse 5.0 for Windows

Mouse emulation software replaces trackballs and pointers with keyboard controls.
Abacus Software
800/451-4319, 616/698-0330
List price: $49.95
Reader service no. 715

Sidekick Finally Rides Into Windows

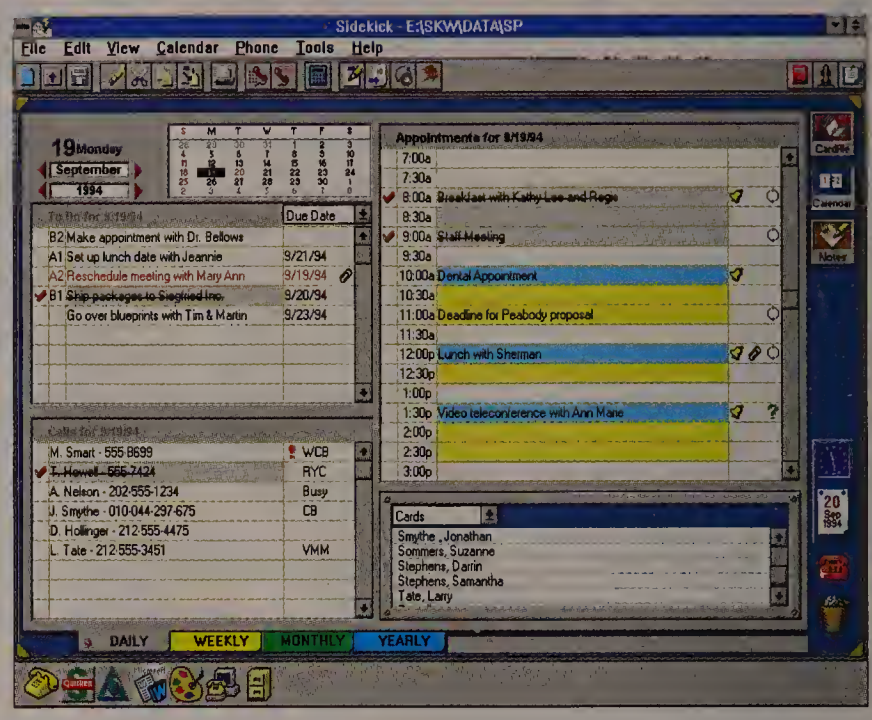
Three years after its last DOS upgrade, the Gabby Hayes of personal information managers has returned, sporting a slick Windows interface and an amiable $29.95 price.

Clearly, this Sidekick has learned a few Windows tricks during its absence. The program looks like a desk blotter, with windows showing your address book, calendar, to-do list, and more. To make an appointment, you simply drag a name from the address book and drop it on your calendar; to dial a phone number with your modem, just drop the name on the phone icon. Like most PIMs, Sidekick lets you keep a log of each event and create reports showing all your activities. You can take notes in a text editor and organize them into folders, print your address book or schedule in Day-Timer and other popular formats, and launch other applications from a convenient icon bar.

Sidekick's strongest feature is its address book. You can sort contact data by any combination of fields—for example, you can view all your contacts by company name or ZIP code. Unfortunately, however, the calendar lacks smarts. Sidekick lets you set up recurring appointments, such as a weekly staff meeting, but it won't give you any warning if the meeting lands on a holiday or conflicts with your semiannual dental examination.

The program also lacks the sophisticated features found in other PIMs such as Lotus Organizer or Arabesque's Ecco, including OLE hooks to E-mail programs. If error-free scheduling is what you're after, get one of the pricier packages. If all you need is an electronic Rolodex with some snazzy calendar and scheduling features, Sidekick for Windows could make a trusty desktop companion.

—Daniel Tynan



SIDEKICK FOR WINDOWS lets you scroll through your address book while perusing your calendar, phone messages, and to-do list.

Sidekick 1.0 for Windows

The original PIM returns with a slick Windows interface.
Borland International
408/431-1000
List price: $29.95
Reader service no. 716

Lotus Joins the Electronic-Forms Fray

With the success of Lotus's groupware products, such as Lotus Notes and cc:Mail, it's no surprise to see the company enter the burgeoning electronic-forms market. Lotus has leveraged its groupware expertise to create Lotus Forms 1.0 for Windows, an automated forms package that uses E-mail software to route forms.

Like many other offerings in the hotly contested forms market, Lotus Forms is divided into separate Designer and Filler modules. In a typical business setting, a supervisor or forms administrator can use Forms Designer to create and maintain electronic forms, while end users can input data with the Filler module.

Any forms package worth its salt excels at trafficking forms among users and handling complex routing instructions. Lotus Forms should do well in this area; the software supports the popular VIM and MAPI messaging protocols, so users of cc:Mail, Microsoft Mail, and other leading E-mail packages can send and receive forms across the net.

Not surprisingly, Lotus Forms provides superior integration with Lotus's cc:Mail (including cc:Mail Remote) and lets users send forms directly from the Forms screen. Administrators can create routing instructions using LotusScript, the company's BASIC-like scripting language. For instance, an expense report above a certain dollar amount can be routed to the Big Boss for final approval. To provide security, Lotus Forms supports digital signatures and data encryption.

One of the biggest benefits of using a forms package is its ability to access corporate data quickly. Using industry-standard ODBC drivers, Lotus Forms can locate information stored in Paradox, Access, FoxPro, dBASE, and other database file formats. For example, when a Lotus Forms user enters a customer ID number into a form, the program can search a database, find the customer's address and other contact information, and automatically paste it into the form.

Users will find that Forms looks a lot like other Lotus applications, with its customizable SmartIcons and its helpful status-bar prompts. Lotus Forms costs $395 for one Designer module and five Filler modules. Additional Filler modules cost $149 apiece; volume discounts are available.

—Michael Desmond

Lotus Forms 1.0 for Windows

Lotus's first offering in the competitive forms-software market.
Lotus Development Corp.
800/346-1305
List price: One Designer module and five Filler modules $395, additional Filler modules $149 each
Reader service no. 717

BEFORE YOU BUY A
COMPUTER,
WE'D LIKE TO SELL YOU A
COMPANY.

ASSEMBL

90MHz, REAL POWER, REAL-TIME VIDEO.

"With the AMBRA DP90PCI, AMBRA...has developed a machine that offers excellent performance at a reasonable price." —*PC Magazine, June 28, 1994*

With its superscalar architecture and an enhanced floating-point unit, the Pentium processor sets the performance standard (up to 150 MIPS). The Intel Pentium 90MHz processor combined with PCI local bus architecture, makes the AMBRA 90MHz mini-tower ideal for resource-intensive applications—such as multimedia, 3D graphics and statistical modeling. What's more, it protects your investment—it's upgradable, expandable and runs over 50,000 X86 applications. All this, along with the greatest number of PCI options and features, enables you to create the most powerful PC ever.

intel inside
pentium™ PROCESSOR

90MHz INTEL PROCESSOR *delivers industry-leading processing speeds up to 147% faster than a 486DX2/66MHz.*

256KB L2 WRITE-BACK CACHE *boosts performance above the integrated 16KB internal on-chip cache.*

VIDEO OPTIONS UP TO 32 MILLION WINMARKS. *PCI video options provide up to 32.1 Winmarks (4.0).*

PCI-SCSI-2 OPTION (EXPANDABLE TO 8GB) *allows you to store an enormous amount of data and advanced applications.*

GRAPHICS BY TSENG LABS

90MHz PENTIUM STANDARD FEATURES

- ▲ Intel 90MHz Pentium CPU
- ▲ 64-bit CPU-Memory-Cache Data Path
- ▲ 256KB L2 & 16KB L1 Cache
- ▲ Fast 32-bit PCI/IDE Controller
- ▲ 4 ISA, 2 PCI & 1 ISA/PCI Slots
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ 6 Drive Bays
- ▲ Lexmark™ 101-Key Keyboard
- ▲ MS-DOS® 6.2, Windows™ 3.1, Mouse
- ▲ One-Year IBM Onsite Service

1 DP90PCI *NOW* $2899

Business Lease: $103/Month

- ▲ Intel 90MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar™ Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Double-Speed Multisession CD-ROM
- ▲ PCI Graphics Accelerator 2MB DRAM

2 MediaPro™ 90 *NOW* $3599

Business Lease: $128/Month

- ▲ Intel 90MHz Pentium CPU
- ▲ 16MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Double-Speed Multisession CD-ROM Drive
- ▲ 16-bit Sound Card & 2 Speakers
- ▲ **TrueVideo™ Capture Board** with Tseng Video Image Processor

3 MediaPro 90T *NOW* $3999

Business Lease: $142/Month

- ▲ Mini-Tower Chassis
- ▲ Intel 90MHz Pentium CPU
- ▲ 16MB RAM, Max: 128MB
- ▲ 1.4GB (2x720MB Enhanced IDE Caviar Hard Disk Drives)
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Double-Speed Multisession CD-ROM Drive
- ▲ 16-bit Sound Card & 2 Speakers
- ▲ **TrueVideo Capture Board** with Tseng Video Image Processor

TRUEVIDEO

- ▲ Connects to Standard Camcorders & VCR
- ▲ Video Capture of Still & Motion Video
- ▲ Comes with Video for Windows,™ & Intel Indeo™ Compression

Versatile Performer

- ▲ High-Performance Graphics & Video
- ▲ Capture & Import Directly into Windows Applications
- ▲ Perfect "Color Scanner" for Presentations, Image Databases

Fast, Powerful Image Processing

- ▲ Ultra-Smooth, Jitter-&-Stagger-Free Live Video
- ▲ Video Acceleration of Clips from CD-ROM & Hard Disk
- ▲ 31 Million Winmarks 4.0 at 1024x768, 256 Colors, at 70Hz

Lifelike Display

- ▲ NI Display of Up to 800x600 (16 Million Colors) or 1280x1024 (256 Colors)
- ▲ Stretch Images Up to 1200 Times with No Loss of Image Quality
- ▲ Selectable Refresh Rates of 30 Frames/Sec, 60 Fields/Sec, or 30 Fields/Sec

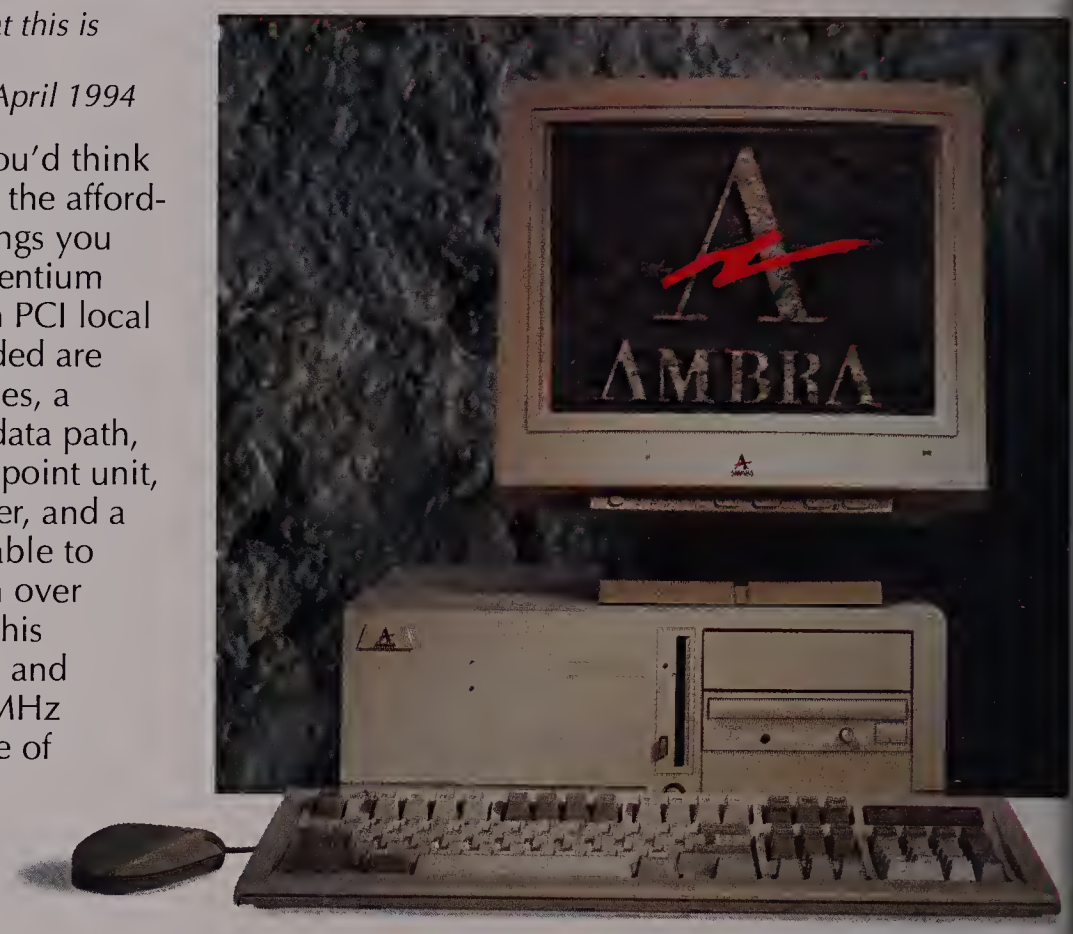
LED HERE ARE OUR

PENTIUM POWER STARTS AT $1899.

"The AMBRA Pentium PCI Desktop makes it clear that this is the new Windows/Multimedia system standard."
—Windows Sources, April 1994

With this much power at your fingertips, you'd think you were sitting at a workstation. Because now the affordable AMBRA Pentium desktop has arrived. It brings you the latest in personal computer technology; a Pentium 60MHz microprocessor with PCI local bus. Standard features included are 256KB L2 and 16KB L1 caches, a 64-bit CPU-memory-cache data path, a high-performance floating-point unit, a fast 32-bit PCI/IDE controller, and a system RAM that is expandable to 128MB and compatible with over 50,000 X86 applications. This combination of performance and compatibility positions the AMBRA Pentium 60MHz systems to meet the needs of the emerging wave of new 32-bit applications and next generation operating systems.

intel inside®
pentium™ PROCESSOR



BUYERS ASSURANCE SEAL WORLD

The AMBRA DP60PCI System, InfoWorld, March 14, 1994

60MHz INTEL PROCESSOR *delivers 100 MIPS with its superscalar, dual-pipelined, enhanced floating-point architecture, increasing your overall productivity.*

PCI LOCAL BUS GRAPHICS ACCELERATOR *options provide a 32-bit or 64-bit graphics engine—ideal for demanding GUI-based applications.*

PCI/IDE DISK CONTROLLER *increases performance by using 32-bit disk access reaching transfer rates up to 11MB/sec (vs. 2MB for standard IDE transfers).*

Accept only the finest...
Caviar
WESTERN DIGITAL

60MHz PENTIUM PCI STANDARD FEATURES

- ▲ Intel 60MHz Pentium CPU
- ▲ 64-bit CPU-Memory-Cache Data Path
- ▲ 256KB L2 & 16KB L1 Cache
- ▲ Fast 32-bit PCI/IDE Controller
- ▲ 4 ISA, 2 PCI & 1 ISA/PCI Slots
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ 6 Drive Bays
- ▲ Fast Serial Ports—16550 UART
- ▲ Enhanced Parallel Port—ECP/EPP
- ▲ Lexmark 101-Key Keyboard
- ▲ MS-DOS 6.2, Windows 3.1, Mouse
- ▲ One-Year IBM Onsite Service

4 **DP60PCI**
NOW $1899
Business Lease: $68/Month

- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 420MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 1MB DRAM

5 **DP60PCI**
NOW $2199
Business Lease: $78/Month

- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 540MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 2MB DRAM
- ▲ Double-Speed Multisession CD-ROM Drive

LIMITED QUANTITIES

6 **DP60PCI**
NOW $2299
Business Lease: $82/Month

- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Diamond Viper PCI Graphics Accelerator 2MB VRAM

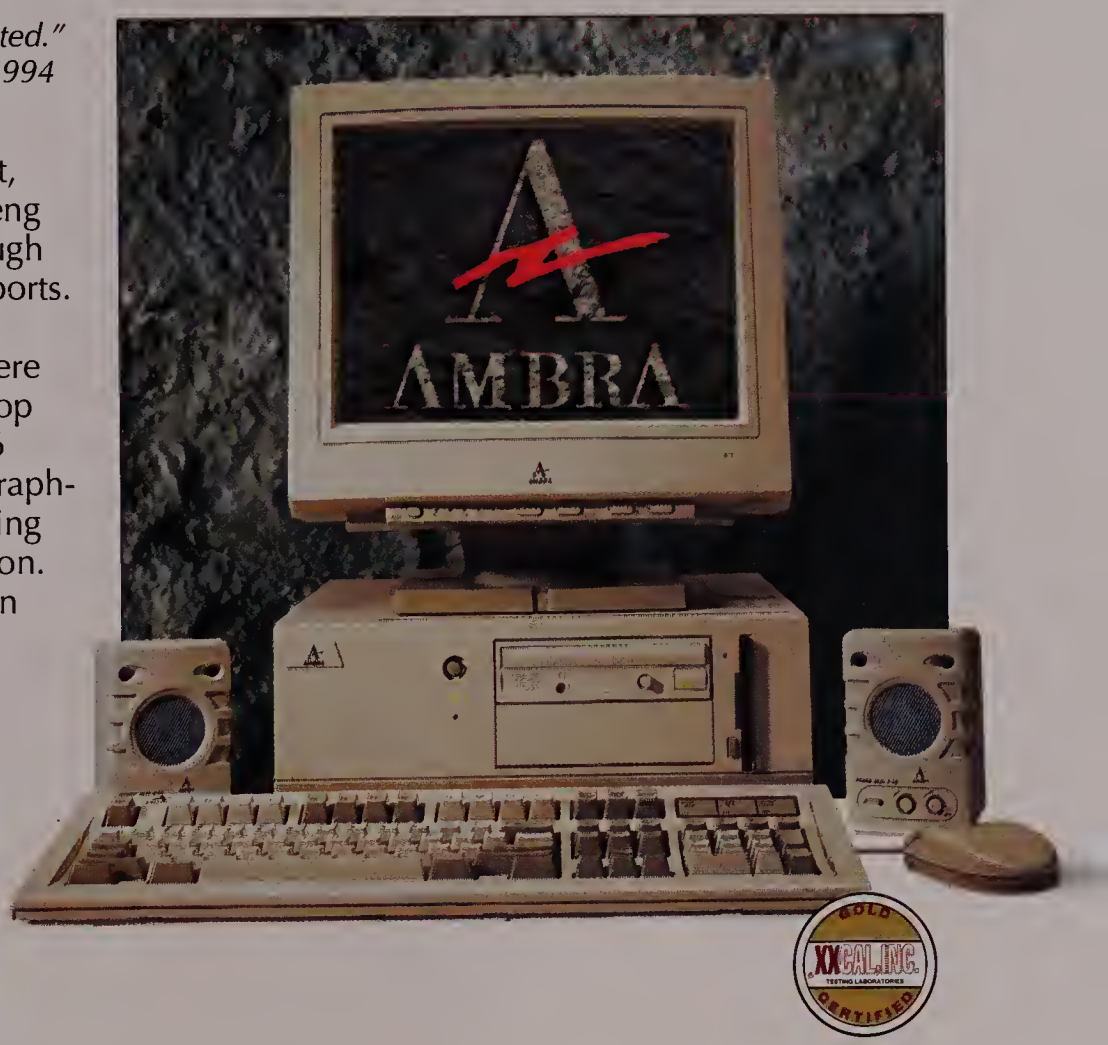
Order any system with a CD-ROM drive and upgrade to multimedia with a 16-bit sound card and 2 stereo speakers for $49 (offer expires 9-30-94).[1]

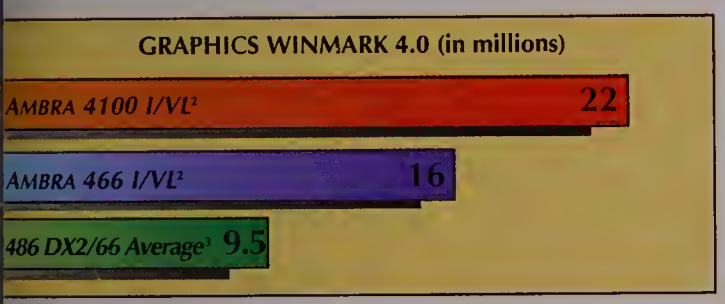
LOWEST PRICES EV

THE FASTEST 486 EVER IS NOW EVEN FASTER.

"...the D466 I/VL (is) the fastest 486DX2/66 we've ever tested."
—InfoWorld, April 4,1994

See for yourself. This is one powerful PC. In fact, ideo performance is now 20% faster with new Tseng V32p video drivers. Add higher performance through ESA® IDE, VESA graphics and enhanced parallel ports. dd investment protection with an upgrade path to entium technology and PCI. For expandability, there re 5 expansion slots and 5 drive bays in the desktop model; 8 expansion slots and 6 drive bays in the mini-tower, graphics upgradable to 2MB, providing True Color at 800x600 resolution. At this price, it all adds up to an incredible value.





UPGRADABLE TO PCI. *Switch to PCI expansion slots by upgrading the riser card and flashing the BIOS.*

TRUE COLOR. *Increased color depth to meet or exceed today's demanding multimedia applications—supports 800x600 True Color.*

FAST SERIAL PORTS. *Two 16-bit high-speed serial ports use a fast 16550 UART. The FIFO buffer allows continued serial communication while the CPU is processing other data.*

ENHANCED PARALLEL PORT (ECP/EPP) *increases print performance from 200KB/sec to 2MB/sec—in simple terms, 133 times faster.*

I/VL DESKTOP STANDARD FEATURES

- Upgradable to PCI & Pentium Technology
- 256KB Write-Back L2 Cache
- Tseng W32p VESA Graphics Accelerator—1MB, Upgradable to 2MB
- VESA Local Bus IDE Hard Drive Controller
- 4 16-bit ISA & 1 32-bit VL Bus Slots
- 3.5" 1.44MB Diskette Drive
- 5 Drive Bays
- Lexmark 101-Key Keyboard
- MS-DOS 6.2, Windows 3.1, Mouse
- Upgrade to Mini-Tower $75
- One-Year IBM Onsite Service

7 D466 I/VL

NOW $1599

Business Lease: $57/Month

- 486DX2/66MHz Processor
- 4MB RAM, Max: 64MB
- 212MB Enhanced IDE Caviar Hard Disk Drive
- 15" FST-NI Color Monitor-LR (13.6" viewable screen size)

The AMBRA D466 I/VL InfoWorld, April 4, 1994

8 BEST BUY D466 I/VL

NOW $2299

Business Lease: $82/Month

- 486DX2/66MHz Processor
- 8MB RAM, Max: 64MB
- 540MB Enhanced IDE Caviar Hard Disk Drive
- 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- 16-bit Sound Card & 2 Speakers
- Borland Office™ on CD:[4] (WordPerfect,® Quattro® Pro & Paradox®)
- Productivity Pack on CD:[5] PhoneDisc USA Business Macromedia Action! SE Macromedia Authorware SE Clipmedia2 Business & Industry

9 BEST BUY D4100 I/VL

NOW $2299

Business Lease: $82/Month

- 100MHz Intel DX4 Processor
- 16KB L1 Cache
- 8MB RAM, Max: 64MB
- 720MB Enhanced IDE Caviar Hard Disk Drive
- 15" FST-NI Color Monitor-LR (13.6" viewable screen size)

ER.

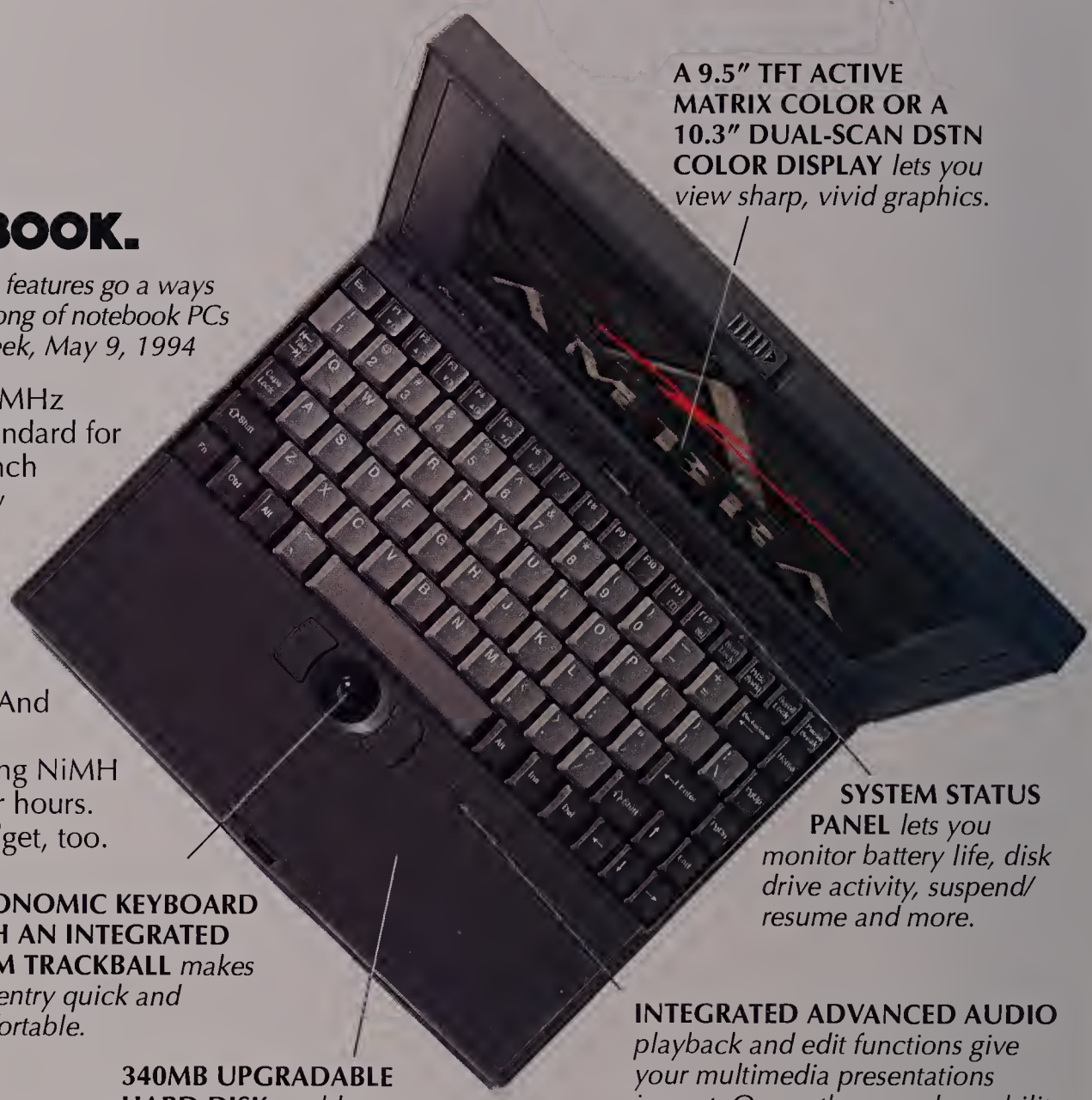
THE ULTIMATE NOTEBOOK.

"...their ergonomic design and attractive features go a ways toward differentiating them from the throng of notebook PCs available." —*PC Week, May 9, 1994*

Powered by a fast Intel DX4/75MHz processor, the N75D sets a new standard for notebooks. The 10.3-inch dual-scan color display screen is sharp and vivid. With integrated audio playback/record, your multimedia presentations will be very powerful. And with an ergonomically designed wrist-rest and a long-lasting NiMH battery, you'll work comfortably for hours. It'll fit comfortably within your budget, too.

PC WORLD BEST BUY

N75D-340
PC World,
August 1994 issue



A 9.5" TFT ACTIVE MATRIX COLOR OR A 10.3" DUAL-SCAN DSTN COLOR DISPLAY *lets you view sharp, vivid graphics.*

SYSTEM STATUS PANEL *lets you monitor battery life, disk drive activity, suspend/resume and more.*

ERGONOMIC KEYBOARD WITH AN INTEGRATED 16MM TRACKBALL *makes data entry quick and comfortable.*

340MB UPGRADABLE HARD DISK *enables you to store tons of data and virtually all kinds of advanced applications.*

INTEGRATED ADVANCED AUDIO *playback and edit functions give your multimedia presentations impact. Or use the record capability through the inline jack.*

RECOMMENDED PRODUCT — PC WORLD

The AMBRA N75D-340, InfoWorld, May 23, 1994

STANDARD NOTEBOOK FEATURES

- ▲ Integrated Audio (Speaker and Microphone)
- ▲ Centered 16mm Trackball
- ▲ System Status Panel
- ▲ 4MB RAM, Max: 20MB
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ Type III PCMCIA Slot (1 Type III/ 2 Type II)
- ▲ 85-Key Keyboard
- ▲ MS-DOS 6.2
- ▲ Windows for Workgroups® 3.11
- ▲ 6.7 Pounds, Including NiMH Battery
- ▲ Includes AC Adapter and Case

10 N75D-340
NOW $2599
Business Lease: $92/Month
- ▲ 75MHz Intel DX4
- ▲ 340MB Hard Disk Drive, Upgradable
- ▲ 10.3" Dual-Scan DSTN Color Display with Local Bus Video and 1MB Video RAM

11 N75T-340
NOW $3499
Business Lease: $124/Month
- ▲ 75MHz Intel DX4
- ▲ 340MB Hard Disk Drive, Upgradable
- ▲ 9.5" Active Matrix TFT Color Display with Local Bus Video and 1MB Video RAM

12 N100T-450
NOW $3699
Business Lease: $131/Month
- ▲ 100MHz Intel DX4
- ▲ 450MB Hard Disk Drive, Upgradable
- ▲ 9.5" Active Matrix TFT Color Display with Local Bus Video and 1MB Video RAM

intel inside

N100 AND N75 OPTIONS

▲ 4MB Memory	**$249**
▲ 8MB Memory	**$449**
▲ 16MB Memory	**$1149**
▲ NiMH Battery	**$139**
▲ Battery Charger	**$99**
▲ 2.4/9.6 kbps Data/Fax Modem	**$169**
▲ 14.4 kbps Data/Fax Modem	**$259**
▲ 12Volt DC Auto Adapter	**$79**
▲ AC Adapter	**$89**
▲ Docking Station	**$399**
▲ Deluxe Carrying Case	**$99**
▲ New GlidePoint®	**$89**
▲ N100T/N75T Extended Warranty	**$349**
▲ N75D Extended Warranty	**$299**

CALL NOW 1800-200-3394

VISA MasterCard DISCOVER NOVUS

AMBRA

IN ORDER TO BUILD AFFORDABLE, WE ASSEMBLED

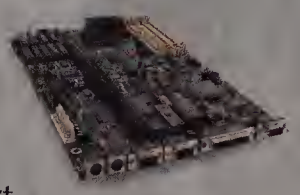
When you buy a computer, you're buying more than just the computer itself. You're also buying the company.

As you look beyond speeds and feeds—and of course, price, price, price—what are you getting? Are the systems reliable? Does the company stand behind their products? Will they even be in business a few years from now?

These are the same considerations that guided us when we created AMBRA,™ the direct-order personal computer company.

OUR COMPANY—A CAREFUL ASSEMBLY OF ROCK-SOLID COMPONENTS.

In a sense, putting our company together was not unlike building a computer. As a nimble, entrepreneurial company, we're able to look at processes rather than departments. Every aspect of our product design, manufacturing, vendor selection, quality control, product testing and customer service is carefully constructed to work as an efficient, interdependent part of a larger, integrated system.



What's more, we continually look for ways to improve all of these processes—all to bring you consistent, reliable computing, from the moment you take an AMBRA system out of the box.

AN OPTIMIZED DESIGN IS JUST THE BEGINNING.

The development of every AMBRA system starts with a simple question: What can we do to bring better computing to today's power-hungry PC users?

Our in-house engineering staff and product development experts constantly assess the evolving needs of both people and businesses. Based on these needs, we then develop system designs that fully exploit and optimize the power of the latest technologies.

THE COMPONENTS OF CHOOSING A SUPPLIER.

We scrupulously examine our potential vendors—for quality, technology and value. We inspect their manufacturing sites. We use reputable suppliers—such as Intel,® IBM® and Western Digital. We test the components in-house—for ruggedness, compatibility and our own demanding benchmarks.

Once we've established a successful partnership with a supplier, we continue to use them as the single source for that particular component. In the long run, this helps us ensure consistency, quality and compatibility.

YOU CAN'T MANUFACTURE THIS LEVEL OF QUALITY.

Next, we send our qualified components to our integrator and manufacturer. Since 1982, they've manufactured over 24 million PCs for demanding clients known for their insistence on delivering quality.

This facility is ISO 9000 certified, which

HIGH-PERFORMANCE COMPUTERS, THE COMPANY FIRST.

means stringent adherence to an established procedure of quality checks, documentation and reporting. Checks along the manufacturing line include assembly verification, initialization wake-up testing, and automatic functional testing for every system.

CHECKS AND RECHECKS.

Our in-house engineering staff performs full component-level and manufactured system evaluations and release tests. Even the packaging is tested.

What's more, every new AMBRA system receives XXCAL Gold Certification, as well as FCC, UL and CUL certification.

We continue to monitor and evaluate every aspect of the entire design and manufacturing process, to deliver more powerful, more reliable personal computing.

As testimony to our success, our products have received numerous glowing reviews and "Best Buy" endorsements. Among them, *InfoWorld, PC World, Windows Sources, PC Week* and *PC Magazine.*

WE'RE RIGHT THERE—WITH ROCK-SOLID SERVICE AND SUPPORT.

After we sell you a computer, we stand behind every purchase. In fact, we've enlisted the best support in the industry.

Every system we sell is backed by toll-free IBM technical service, 24 hours a day, 7 days a week. And for desktops and mini-towers, IBM onsite technical service is included. Finally, if you're not completely satisfied, return your purchase within 30 days, and we'll give you your money back. Period.

At AMBRA, we're committed to you, our customer. We'll always be there when you need us—now and in the future.

PENTIUM POWER STARTS AT JUST $1899, THE FASTEST 486DX2 EVER IS ONLY $1599, AND OUR 75MHZ DX4 NOTEBOOK IS ONLY $2899.

We do more than just promise high-powered, low-priced computing. We're ready to deliver—today.

In the pages that follow, compare our reliable, leading-edge technology. Pentium™ desktops and mini-towers, optimized I/VLs and powerhouse notebooks, among others.

Compare our prices—the lowest ever. And when it comes to our reliable service and support, there is no comparison.

Compare, and you'll be sold on our computers—and our company.

AMBRA™

WE COULD GO ON AND ON.

All AMBRA Desktops and Mini-Towers Feature:

- ▲ *Upgrade Path to Pentium Technology*
- ▲ *3.5" 1.44MB Diskette Drive*
- ▲ *Lexmark 101-Key Keyboard*
- ▲ *MS-DOS 6.2*
- ▲ *Windows 3.1*
- ▲ *Mouse*
- ▲ *One-Year IBM Onsite Service*

486 DESKTOP SYSTEMS

13 486SX/33MHz
NOW $1299
Model D433SXA
Business Lease: $46/Month
- ▲ 128KB L2 Cache, Max: 256KB
- ▲ 4MB RAM, Max: 36MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA Local Bus Graphics Accelerator 1MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ 5 ISA Slots & 5 Drive Bays

14 486DX2/50MHz
NOW $1369
Model S450DX
Business Lease: $49/Month
- ▲ 128KB L2 Cache, Max: 256KB
- ▲ 4MB RAM, Max: 36MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA Local Bus Graphics Accelerator 1MB
- ▲ 2 VESA & 1 ISA Slots
- ▲ 3 Drive Bays

15 486DX2/66MHz
NOW $1599
Model D466DXA
Business Lease: $57/Month
- ▲ 128KB L2 Cache, Max: 256KB
- ▲ 8MB RAM, Max: 36MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA Local Bus Graphics Accelerator 1MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ 5 ISA Slots & 5 Drive Bays

UPGRADABLE BUS MODEL

16 486DX2/66MHz
NOW $1799
Model D466 I/VL
Business Lease: $64/Month
- ▲ 256KB L2 Cache, Write-Back
- ▲ 8MB RAM, Max: 64MB
- ▲ 270MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Tseng W32p VESA Local Bus Graphics Accelerator 1MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ 4 16-bit ISA & 1 32-bit VL Bus Slots
- ▲ 5 Drive Bays

RECOMMENDED PRODUCT — INFOWORLD

InfoWorld, April 4, 1994

PENTIUM/PCI's

17 60MHz PCI
NOW $1899
Model DP60PCI
Business Lease: $68/Month
- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 420MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 1MB DRAM

18 60MHz PCI
NOW $2299
Model DP60PCI
Business Lease: $82/Month
- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Diamond Viper Graphics Accelerator 2MB VRAM

19 90MHz PCI
NOW $2899
Model DP90PCI
Business Lease: $103/Month
- ▲ Intel 90MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ Double-Speed CD-ROM Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 2MB DRAM

Add a Double-Speed Multisession CD-ROM Drive, 16-bit Sound Card and 2 Speakers to Any System, for $198.

Ask About Our CD 5-Pack Specials for $79.

MOBILE SYSTEMS

20 486SX/33MHz
NOW $1699
Model N433C-120
Business Lease: $60/Month
- ▲ 4MB RAM, Max: 12MB
- ▲ 120MB Hard Disk Drive
- ▲ 9.5" Dual-Scan Color Display
- ▲ 1 Type III PCMCIA Slot
- ▲ 3.5" Diskette Drive
- ▲ 86-Key Keyboard
- ▲ Integrated 16mm Trackball
- ▲ 6.6 Pounds, Including Battery
- ▲ Carrying Case
- ▲ MS-DOS 6.2, Windows 3.1
- ▲ Borland Office (WordPerfect, Quattro Pro and Paradox)[6]
- ▲ New Sidekick® for Windows

21 486DX2/50MHz
NOW $2999
Model N450T-200
Business Lease: $106/Month
- ▲ 8MB RAM, Max: 12MB
- ▲ 200MB Hard Disk Drive
- ▲ 9.5" Active Matrix TFT Color Display
- ▲ 1 Type III PCMCIA Slot
- ▲ 3.5" Diskette Drive
- ▲ 86-Key Keyboard
- ▲ Integrated 16mm Trackball
- ▲ MS-DOS 6.2, Windows 3.1
- ▲ 6.6 Pounds, Including Battery
- ▲ Carrying Case

Get configuration 21, with a 9.5-inch dual-scan display and 4MB RAM, now for only $2199.
Model N450C-200
Business Lease: $78/Month

intel inside

CALL TODAY.
1800-200-3394

VISA MasterCard DISCOVER NOVUS

©1994 AMBRA Computer Corporation. AMBRA is a trademark of ICPI Ltd. and used under license therefrom. The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation. The Intel Inside and Pentium Processor Logos are registered trademarks of Intel Corporation. All other brands and product names are registered trademarks, trademarks or service marks of their respective holders. Please call for details regarding AMBRA's money-back guarantee, warranty and credit terms. Onsite service may not be available in certain locations. Offerings may differ in Canada. Offerings, prices and products are subject to change without prior notice. Prices do not include shipping. Return shipping and insurance charges are the responsibility of the customer. Lease based on 36 months, offered by IBM Credit Corp. [1]Upgrade good at time of system purchase. [2]AMBRA self-tested with 2MB Video DRAM using 1024x768x256 colors, 70Hz. [3]Test from *PC Magazine*, December 7, 1993. [4]Manuals on CD. Printed manuals can be purchased from Borland and WordPerfect. [5]All manuals on CD. [6]Borland Office OEM version includes Getting Started Manual. Printed copies of product manuals can be purchased from Borland and WordPerfect.

AMBRA

SelectPhone: America's Phone Book on CD ROM

Some ideas are so brilliant you wonder why it took so long for someone to think them up. In the case of Pro CD's SelectPhone, a CD ROM compilation of every phone directory in the United States (that's about 80 million phone numbers *and* addresses), it was probably more a matter of waiting for CD ROM technology to get up to speed. Considering how long it takes to drag out your local directory and look up a number, or how much it costs to call long-distance information (and how, when you do, you can't always get an address or more than one number), this new Windows-based business tool is a fantastic time-saver.

A fast, powerful search utility makes it a snap to call up multiple listings sorted by name, address, area code, ZIP code, or business type. Want to know how many competitors your business has? Simply enter a search based on SelectPhone's industrial classification codes, and a list of firms will appear.

You can limit your searches to business only or residence only. Once you've got the information, you can process it in several ways: Print it, export it to your word processor, send it to your database program in a format that supports mailing label output, or simply click the World icon to have the program's MapLinx Lite utility show every highlighted listing on a U.S. map. There's even an auto-dialer.

Considering the massive amount of data SelectPhone needs to sort, its search routines are amazingly fast. Even allowing time to load the disk into your CD ROM drive and start the program, SelectPhone is much faster than paging through a phone book (not to mention paging through 10,000 phone books). Pro CD has pledged to update its listings quarterly, as new directories are released. The current listings are accurate as of early 1994.

I have only one complaint: Since it takes four regional disks to cover the United States, if you really need to check listings all over the country, you'll have to do four separate searches and combine the results manually.

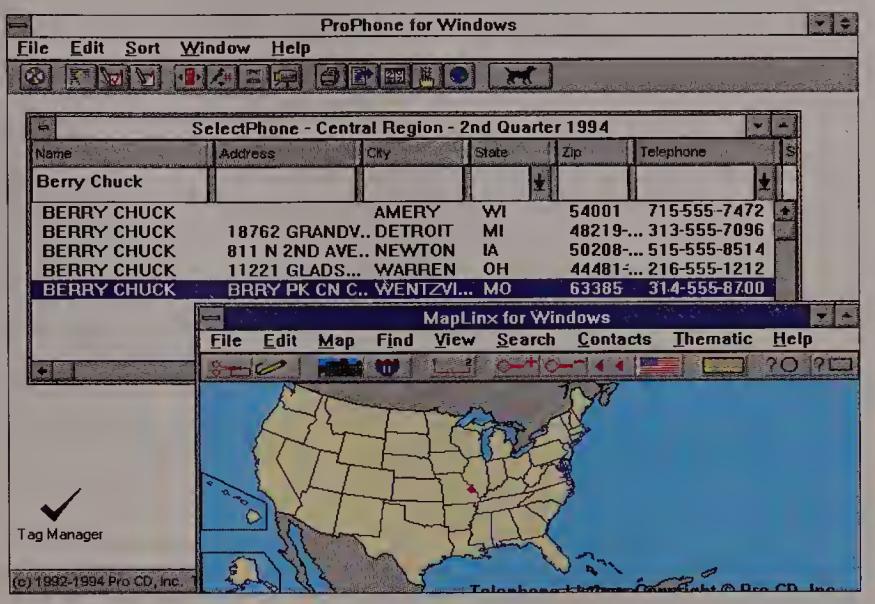
Pro CD sells two other, similar products: DirectPhone includes the same phone numbers and addresses as SelectPhone but is searchable only by name; the package costs around $99 on the street. FreePhone, a fully searchable listing of every 800 number in the United States, costs about $29.

SelectPhone isn't the only Windows-based U.S. phone book. Digital Directory Assistance's PhoneDisc for Windows offers similar features and should be shipping by the time you read this. Unfortunately, it was unavailable for review at press time.

–Michael Goodwin

SelectPhone

Every U.S. residential and business phone number and address on CD ROM.
Pro CD Inc.
800/992-3766, 508/750-0000
Street price: $199
Reader service no. 767



BACK IN THE U.S.A.: Even rock 'n' roller Chuck Berry is easy to find using SelectPhone's powerful search function.

CompuServe Goes Multimedia

CompuServeCD is a cross between a digital magazine about CompuServe and an interactive, multimedia guide to the online service. The product has a shopping section, articles about the service, videos, and even games and entertainment.

You can take a behind-the-scenes look at life on the road with Jimmy Buffet, check out the movie previews, play demo and shareware games, and listen to music clips from soon-to-be-released albums.

If you're nervous about CompuServe's high hourly online charges, you can use the CD ROM to preview CompuServe forums before logging on. But if you're like most people, you're probably too busy to spend hours browsing an online service. The disk's File Finder may therefore be the most useful feature. It lets you locate interesting files on CompuServe before you log on. Then, when you do connect, File Finder downloads the files for you automatically. The disk also comes with the latest version of CompuServe Information Manager for Windows, a graphical interface that makes it easier to navigate the online service.

A CompuServeCD subscription costs $7.95 per disk. Until mid-1995, CompuServe will release a new disk every other month. After that, disks will come out monthly. To subscribe, type **GO CCD** on CompuServe and follow the instructions. Your subscription will be billed to your CompuServe account.

–Christina Wood

CompuServeCD

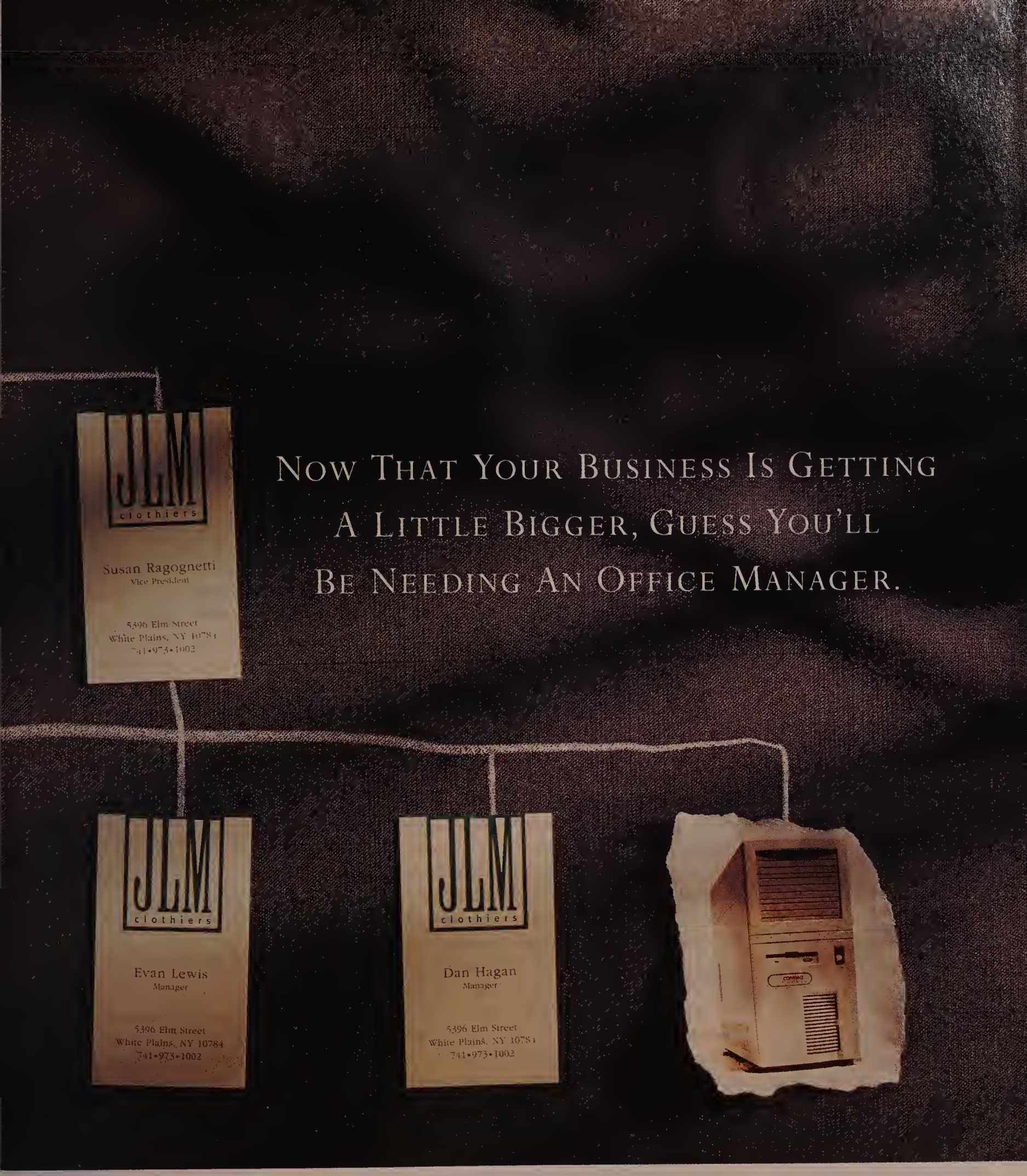
MULTIMEDIA Multimedia magazine and guide to the online service.
CompuServe
800/848-8199
Price: $7.95 per disk
Reader service no. 768

These days, all it takes is a little success to overload your business. The more you demand of your computers, the slower things can get. Well, that's because PCs are made to be PCs. And at this point, what you really need is a server—the most efficient way to get your PCs working together.

So we'd like to introduce you to the Compaq ProSignia VS. Now, for the price of a desktop, you can get a real, industrial-strength server made by the company who knows the technology best. (Compaq is recognized as the world leader in servers.*)

Unlike a PC, the ProSignia VS is specifically designed for the job of powering a computer network in small- to medium-sized businesses. It's optimized for high-speed file transfers, to eliminate the finger-tapping during everyday tasks, like calling up a customer record to take an order. It also expands easily to

© 1994 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. ProSignia VS is a trademark and PaqFax is a service mark of Compaq Computer Corporation. SmartSt
covered by a one-year warranty.



provide vast, centralized storage as your business grows larger.

And while most servers are complicated, the ProSignia VS can make your life easier. Our optional CD-based SmartStart simplifies the whole process of setting up a reliable system. And Insight Manager (also an option) keeps an eye on key parts, pinpointing problems *before* they can disrupt operations.

Of course, the ProSignia VS also provides the security of Compaq's three-year on-site warranty** and 24-hour support line.

To find out how you can give your company more agility as it grows, visit an authorized Compaq reseller. If you'd like more information, or if you'd like the name of your nearest reseller, call us at 1-800-638-8258, ext. 450. We can show you the best kind of office manager: One that works as hard as you do.

COMPAQ

t Manager are registered trademarks of Compaq Computer Corporation. *Source: International Data Corporation, 1993. **Certain restrictions and exclusions may apply. Monitors, battery packs and certain options are

Circle 88 on reader service card

A Better-Integrated WordPerfect Office: GroupWise 4.1

The most immediately apparent change in the latest version of WordPerfect Office—WordPerfect Corporation's electronic mail and groupware package—is that it's not called WordPerfect Office anymore. The company has dubbed the new version GroupWise 4.1 (changed from Symmetry at press time), saying that products like Microsoft Office have led users to associate the term *office* with business software suites, an entirely different kind of package. The company also wants to distinguish GroupWise from its PerfectOffice business suite, which ships this fall.

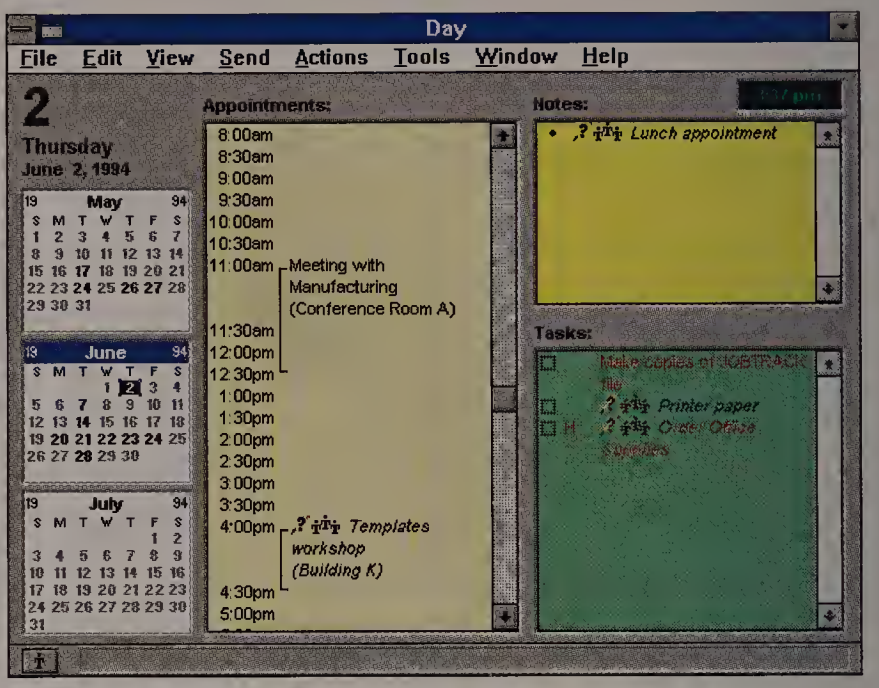
Despite the new name, WordPerfect Office 4.0 users won't find major changes in the program's E-mail, calendar, and scheduling functions. Many of version 4.1's improvements increase GroupWise's interaction with other applications; for example, it now supports the Simple MAPI protocol, which allows Windows users to send E-mail directly from within the wide range of MAPI-enabled programs. Since developers can tightly integrate their applications with GroupWise, you'll be able to access, say, a word processing feature from a GroupWise menu. WordPerfect plans to extend this level of integration to its InForms forms application and other programs.

GroupWise's Windows client is one of the first WordPerfect programs to adhere to PerfectFit, a set of specifications designed to create a common look and feel for the company's major applications. Like similar strategies at Microsoft and Lotus, PerfectFit will result in programs that have similar menu layouts and dialog boxes, and that share other features such as a spelling checker. PerfectFit will be implemented more substantially when it appears as part of PerfectOffice 3.0.

GroupWise 4.1 retains its remote client software, which lets mobile users keep in touch with the office and adds optional support for pagers and the most pervasive communication devices of all: touch-tone telephones. Support for the latter is provided via the Telephone Access Server, a $9995 OS/2-based module that allows travelers to dial in from a phone and use voice menus to check E-mail and calendar items; you can also make schedule changes and send voice messages to other GroupWise users.

Most of the other enhancements are under-the-hood fixes aimed at network administrators, although many of these will also benefit end users. For instance, net managers can now do routine maintenance on the GroupWise database without disrupting users' access to the E-mail system. And in addition to DOS, Windows, and Macintosh versions, there are new GroupWise editions for seven UNIX platforms and a version for PowerPC-based Macs.

—Harry McCracken



GROUPWISE 4.1 INCLUDES WordPerfect Office 4.0's E-mail, calendar, and scheduling features and improves network integration.

GroupWise 4.1

WordPerfect Office gets a new name and under-the-hood changes.
WordPerfect
801/225-5000
List price: $695 (for five users and DOS administration; discounts available for additional licenses)
Reader service no. 705

Eclipse Fax 6.0: Fast Fax Manager

What's in a version number? Phoenix Technologies' $84.95 Eclipse Fax is the latest Windows package to make the leap to version 6.0—even though it's in its third release. Version confusion aside, Eclipse Fax 6.0 includes several significant enhancements. Most notable is the program's new Fax Assistant utility, which automates the processing of incoming and outgoing faxes. Let's say you want to store all faxes received from Sharon in C:\FAX\SHARON; Fax Assistant will automatically recognize an incoming fax from Sharon's fax device and save it in that directory.

How does Fax Assistant work? Most fax devices transmit their fax number at the top of the page when sending a fax. Fax Assistant reads the number and determines if it matches a fax number in your Eclipse Fax phone book. If it finds a match, Fax Assistant processes the fax according to your instructions. Fax Assistant can automatically print, save, delete, or OCR incoming faxes. It can also date- and time-stamp faxes, and fax copies to as many as ten recipients. You can configure Fax Assistant to automatically select different cover sheets for different recipients. You can also send complex presentations in thumbnail form—an easy way to reduce phone costs.

Eclipse Fax 6.0's enhanced dialer supports multiple credit cards and can save a specific credit card number for each person in your phone book.

—Jeff Bertolucci

Eclipse Fax 6.0

Low-cost fax program with automatic fax processing.
Phoenix Technologies
800/452-0120
List price: $84.95
Reader service no. 706

CaLANdar 3.0: This Scheduler Rides the E-Mail Highway

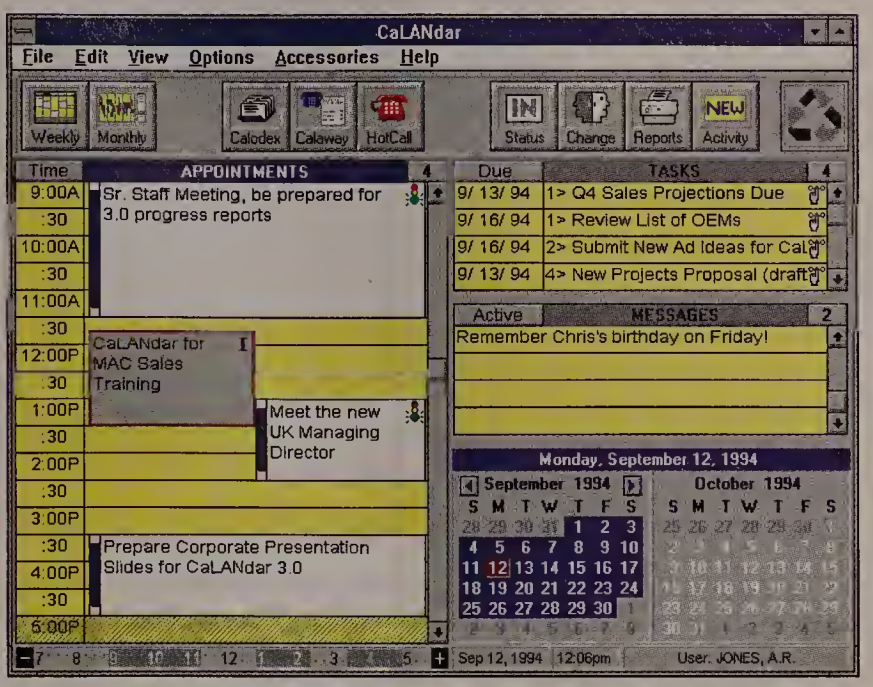
Is it groupware? A scheduler? A personal information manager? Microsystems Software's CaLANdar 3.0 is all of the above and more. At heart, CaLANdar is a group-scheduling package that juggles and coordinates the schedules of virtually any number of people. With versions available for DOS, Windows, and Macintosh PCs (not to mention a Satellite version for mobile users), it's especially well suited for large companies with cross-platform requirements.

CaLANdar has enough features to make it the PIM of choice for most users, and its well-integrated interface is easy to learn. CaLANdar features the usual personal and group appointment scheduling functions, a handy task list, and a message center. Also included are public and private address books, as well as an electronic "pegboard" for keeping track of who's in and out. With its graphical displays of group schedules, CaLANdar is particularly adept at coordinating meetings and other office activities. Give it a list of people and the length of time an activity will require, and CaLANdar will pick a time when everyone's available.

You can use CaLANdar by itself; its automatic "enote" feature will send data across the network. But if you have a full-fledged E-mail system (such as cc:Mail, Microsoft Mail, or an MHS-compatible product), CaLANdar tightly integrates itself with the system and uses it to transport schedules, notifications, and so on.

Another unique CaLANdar feature is People Pools. It allows a manager or administrative assistant to schedule a group of individuals (such as off-site personnel).

–Stan Miastkowski



KEEPING COORDINATED: CaLANdar 3.0 schedules both group and individual activities and can work via your network's E-mail system.

CaLANdar 3.0

Group-scheduling software that works with virtually all popular E-mail packages.
Microsystems Software, Inc.
508/879-9000,
508/626-8515 (fax)
List price: $30 to $59.50 per user (depending on E-mail system and number of users)
Reader service no. 707

Coactive Connector 2.0 Does E-Mail

Coactive Connector, the plug-and-play network for small offices, now features E-mail for Windows users. Designed for businesses that have simple file- and printer-sharing needs, the product has won accolades for its ability to link DOS, Windows, and Macintosh computers easily—no networking knowledge required. Coactive Connector for DOS/Windows plugs into the parallel port (so you don't have to open the machine) and uses standard phone cable to connect up to 32 machines within a 1000-foot area.

Coactive Connector's file throughput speed has been improved in version 2.0 to 13 kilobits per second—still miserably slow compared with ethernet's 10-megabit-per-second rate, but fast enough for simple file transfers and print jobs.

The big news, however, is Coactive Connector 2.0's new E-mail facility for Windows users. Although bare-bones compared with sophisticated E-mail programs such as cc:Mail and Microsoft Mail, Coactive's CoMail software does support the basics: sending and receiving messages and file attachments. Unfortunately, Coactive doesn't yet offer E-mail for Macintosh or DOS users.

The Connector for DOS/Windows includes an internal processor. On the Mac side, Apple's built-in networking eliminates the need for a microprocessor, which greatly reduces the cost: Coactive's Connector for DOS/Windows is $149.95, while the Macintosh version is only $29.95.

There's no question that just about anyone reading this can get a Coactive network up and running in less than 20 minutes. The question is, *should* you? In many cases, the answer is no. Wide area networks are becoming increasingly important, and it isn't that hard to install an ethernet card and have a fully operational, extensible network. If you run solely under Windows, the networking software built into Windows for Workgroups is an option. And if you need to connect a mix of computing environments, you could install TCP/IP, which gives you a full suite of elegant network protocols available to *any* machine—whether UNIX, DOS, Windows, OS/2, or Macintosh.

–Joe Abernathy

Coactive Connector 2.0

Simple printer- and file-sharing LAN now includes E-mail.
Coactive Computing Corp.
800/727-4273,
415/802-1080
List price: Connector for DOS/Windows $149.95, two-machine starter kit $399.95, Mac-to-PC connection kit $179.95
Reader service no. 782

AnyTime 2.1 for Windows

For people who want an inexpensive personal information manager (PIM), AnyTime 2.1 for Windows provides basic functionality at a rock-bottom $30 street price. The new version adds one significant feature: the ability to import and export data from existing databases and scheduling programs. AnyTime 2.1 also offers 53 customizable print layouts—useful for taking contact and schedule information with you. Modules include a scheduler, an address book, and a to-do list, and AnyTime sports the necessary PIM convenience features, such as the ability to set recurring appointments. While AnyTime 2.1 doesn't have all the features of more-expensive PIMs—for example, you cannot link documents to contact names—it's an easy-to-use application with a painless price, and it should serve beginners well. Version 2.0 users can get the upgrade for just a $4.95 shipping fee. AnyTime 2.1 for Windows lists for $49.95. Individual Software, 800/822-3522, 510/734-6767.

Reader service no. 757

LOW-COST INFORMATION MANAGER: Street priced at about $30, AnyTime 2.1 for Windows offers many useful scheduling features.

American Heritage Talking Dictionary

The American Heritage Talking Dictionary on CD ROM does just what its name says: It pronounces more than 200,000 words for you. It has all the features you'd expect from a traditional printed or electronic dictionary, including correct spelling and sample sentences. You can search for words based on spelling, partial definitions, and Boolean search criteria. The disk also includes the 500,000-word Roget's II Electronic Thesaurus, and there's even an anagram feature: Type in a word, and the program discovers more words by rearranging the letters. The American Heritage Talking Dictionary lists for $59.95. SoftKey Int'l, 617/494-5801.

Reader service no. 756

Conversions Plus 2.5 for Windows

Conversions Plus for Windows lets you exchange files between PCs and Macintoshes. Version 2.5 supports several new file formats, including Word 6.0 for Windows, Excel 5.0, WordPerfect 3.0 for the Mac, and OLE 2.0. You can move files via a floppy disk or network from Mac to PC, PC to Mac, or PC to PC. The product supports many word processor, spreadsheet, database, and graphics file formats. Conversions Plus 2.5 for Windows lists for $149. DataViz, 800/733-0030.

Reader service no. 758

DisplayMate for Windows

The first Windows version of this software utility helps you get the most from your computer's display without having to know all the technical details. DisplayMate produces a series of complex images that test monitor scanning frequencies, video modes, and color palettes and intensities. The program suggests monitor and video board adjustments that you can make for enhanced sharpness, contrast, color and gray-scale accuracy, and other technical improvements. DisplayMate for Windows is priced at $79. Sonera Technologies, 800/932-6323, 908/747-4523 (fax).

Reader service no. 759

DacEasy Executive Information System in DOS

DOS is dead. Long live DOS. DOS really *is* dead, except in the accounting world. Who wants to reenter five or ten years' worth of company data? DacEasy, a longtime leader in accounting software, seeks to put the best face on this problem with a Windows-based package called DacEasy Executive Information System (EIS). It reads DOS-based DacEasy accounting files and lets you create charts, graphs, and presentations in Windows, either on screen or as overheads or 35mm slides. The product includes standard presentation tools, such as background templates, clip art, and screen-show transitions. EIS lists for $149.95. DacEasy, 214/732-7500.

Reader service no. 761

Emergency Disk 2.0, SpeedTools 2.0

Central Point's Emergency Disk 2.0 and SpeedTools 2.0 are inexpensive subsets of the company's popular $179.95 PC Tools utilities package. Emergency Disk creates a single crash-recovery floppy disk containing all your critical system information. It includes DOS versions of Central Point's DiskFix, Memory Information, Undelete, PC Format, and Unformat utilities—all of which should fit on the emergency floppy. SpeedTools 2.0 is designed to make your Windows PC run faster. SpeedTools analyzes your machine, then gives performance-boosting recommendations, defragments the hard drive, and provides help for editing Windows INI files. Both Emergency Disk and SpeedTools ($29.95 each) come with an offer to upgrade to the full PC Tools package for $49.95; considering that PC Tools sells for about $100 on the street, this upgrade may be the cheapest way to buy it. Central Point Software, 800/964-6896, 503/690-8088.

Reader service no. 762

TripMaker for Windows

Ask anyone who's tried to navigate the freeways of Los Angeles or circumnavigate Boston's labyrinth of streets: You're a sucker if you don't plan a car trip ahead of time. Before you drive off to your next destination, take a look at Rand McNally's TripMaker, a Windows program packed with

INTRODUCING REMOTE EVERYTHING: NEW CARBON COPY 2.5

It can happen anywhere: at home, in your hotel room, an airport lounge, while you're overseas. Suddenly you've got to get at a file, access e-mail—maybe even run a program—that's in the PC back at your office.

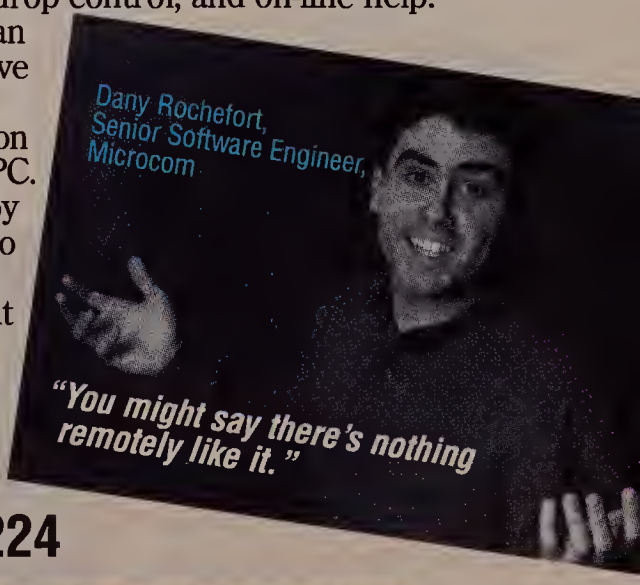
Now there's a total remote-communications package that lets you do it all, faster than ever. Microcom's new Carbon Copy™ 2.5 offers you easy access and complete control of the files, applications and peripherals of another PC or LAN, no matter where you are.

With its new software gateway you can dial into a single LAN modem and access any PC on the network (ideal for small offices). A built-in terminal emulator allows direct access to on-line services like CompuServe®, and electronic bulletin board systems (BBSs). And Carbon Copy 2.5 supports leading file transfer protocols—no need for additional communications software.

A true Windows application, Carbon Copy 2.5 runs effortlessly, right out of the box. With simple point-and-click, drag-and-drop control; and on-line help. What's more, you can now send and retrieve files between PCs, whether or not Carbon Copy is on the host PC.

New Carbon Copy 2.5: when it comes to fast, easy remote access, we've thought of everything. For free information and the name of your local Microcom dealer, phone

1-800-822-8224



All-In-One Remote Communications

Integrated Terminal Emulator

Remote Control

File Transfer

Software Gateway

Remote Clipboard

Also check out Microcom's 28.8 DeskPorte™ *FAST* and TravelPorte™ *FAST* high-speed modems.

Upgrade to Carbon Copy 2.5 for only $49

Now for a limited time, upgrade to Carbon Copy 2.5 from any competitive remote communications software, or any version of Carbon Copy, for only $49. Call today: 1-800-765-1750.

microcom®

The brightest ideas in remote access.

Microcom, Inc., USA (617) 551-1000 • Microcom U.K. Limited, (44) 483-740763
Microcom E.M.A., France (33) 1 46 62 68 68 • Microcom Singapore, (65) 295-2061
Microcom Australia, (61) 2 410-9953

Microcom is a registered trademark and Carbon Copy, DeskPorte and TravelPorte are trademarks of Microcom Systems, Inc. All other trademarks are the property of their respective trademark holders.

Circle 157 on reader service card

maps of the United States and an extensive database of tourist information about roads and cities in the United States, Canada, and Mexico. TripMaker finds direct routes from point to point, calculates travel times, and even suggests fun side trips. For example, it can help a business traveler find the quickest route to cover four cities in three days, and vacation planners can search TripMaker's database for cities within a given distance and filter them based on, for example, historic sites or children's activities. TripMaker offers 88 preplanned trips, such as a tour of Northern California's wine country.

One limitation: While TripMaker provides national and state maps with insets of some cities, it doesn't offer detailed city street maps—presumably, that much information would be hard to fit on floppies. However, the $79 program does give page and grid references to the printed Rand McNally Road Atlas. Rand McNally, 800/671-5006 ext. 102, 708/329-8100.

Reader service no. 760

PowerLAN 3.1

Peer-to-peer LANs are finally getting some respect and are branching out from their small-business-only orientation into corporate work groups connected to large networks. PowerLAN 3.1—the latest incarnation of a peer-to-peer package that is not as well-known as it should be—offers enhancements that integrate it easily into existing NetWare LANs. PowerLAN is easy to install, has advanced management features, and is no slouch in the performance department. You can install it on any NetWare workstation without having to reconfigure the system. The product cleverly color-codes network resources, with PowerLAN in blue and NetWare in red. A five-user PowerLAN package sells for $395, single add-on licenses are $99, and for ultimate performance, $295 buys PowerServe, a dedicated server package. Performance Technology, 210/979-2000, 210/979-2002 (fax).

Reader service no. 763

Kai's Power Tools 2.0 for Windows

What image-editing tool does Purple Haze, Strawberry Fields, and other cool effects? Kai's Power Tools. Version 2.0 is faster than its predecessor, and its slick new controls unveil all the advanced features buried inside the earlier version. This add-on utility works with Adobe Photoshop, Fractal Design Painter, Micrografx Picture Publisher, Fauve Matisse, Corel PhotoPaint 5, and any image editor using Adobe's plug-in standard. If you're creating a background or filling a font, the new real-time preview screen lets you see the results before applying them. Better interaction between the Texture Explorer, Gradient Designer, and color path tools radically improve each tool's precision and power. You can select from many textures—and if none is right for your design, you can pick a new color or use the "equalizer" tool to alter the texture's detail, blur, or roughness. The 33 filters include the new Seamless Welder for creating smooth patterns, and Fade Contrast for aging images. Kai's Power Tools 2.0 for Windows lists for $199; upgrades are $59.95. HSC Software, 310/392-8441.

Reader service no. 764

Sharkware Professional 2.0 for Windows

The new Professional version of CogniTech's Sharkware personal information manager helps you manage contacts and any documents related to them. Sharkware Professional 2.0 supports OLE 2.0 and integrates with VIM- and MAPI-compliant E-mail (including cc:Mail and Microsoft Mail) and with popular fax programs such as WinFax Pro 4.0. Thanks to the OLE 2.0 support, you can link or embed objects (such as documents and spreadsheets) into appointment-book entries and contact histories. And CogniTech has rewritten some of Sharkware's code to make it run faster. Like Symantec's Act contact manager, Sharkware Professional 2.0 offers many features for customizing and managing large groups of contacts. In addition, Sharkware Professional gives tidbits of advice from Harvey Mackay, author of the best-seller *Swim With the Sharks Without Being Eaten Alive.* List price is $199.95. CogniTech, 800/947-5075, 404/518-4577.

Reader service no. 765

EYE-DAZZLING EFFECTS: Kai's Power Tools 2.0, a special-effects utility, now offers faster performance and an improved interface.

Carbon Copy 2.5 for Windows

Remote-control packages have become essential tools for accessing a PC via modem. Carbon Copy was one of the first, and version 2.5 has new features that make remote connections faster and easier. Microcom claims that a new Windows virtual communications driver makes the new version 30 percent faster than its predecessor. Carbon Copy 2.5 also supports Microcom's 28.8-kbps V.fast modems, which can use a PC's parallel port instead of the slower serial port.

Also new and useful is a full-featured integrated communications package for one-stop access to online services such as CompuServe. And for networked environments, there's a software gateway that works two ways: On the road you can access your network remotely, while in the office multiple users can share a single modem and phone line. At $199, the price remains the same; an upgrade from a previous version will cost you $49. Microcom, 800/822-8224, 617/551-1000, 617/551-1021 (fax).

Reader service no. 766

For more information about any product, contact the manufacturer or circle the number on the reader service card.

"I knew it. I knew it. I knew it."

I blew it...

The surge protector I've been using didn't have the *joules for the job.* They tried to tell me, "the more joules your surge protector has the more protection you have!" But did I listen? I guess that's obvious! And did the surge protector come with a *connected equipment warranty?* Ask my checkbook.

Curtis Surge Protectors offer the highest joule rating totals in their class. The higher the joule rating, the more energy the surge protector can absorb.

Curtis also backs their surge protectors' performance by covering the equipment that is plugged into it. So don't "BLOW IT". Dare to compare–you won't find better value *anywhere.*

Manufacturing Company, Inc.

CURTIS

30 Fitzgerald Dr., Jaffrey, NH 03452 USA

©Copyright 1994 Curtis Mfg. Co., Inc.
All Rights Reserved

Curtis offers a complete line of ten different surge protectors.
For more information, call Curtis at 1-800-955-5544 Ext. 240

This is a busi

software prog

Do no

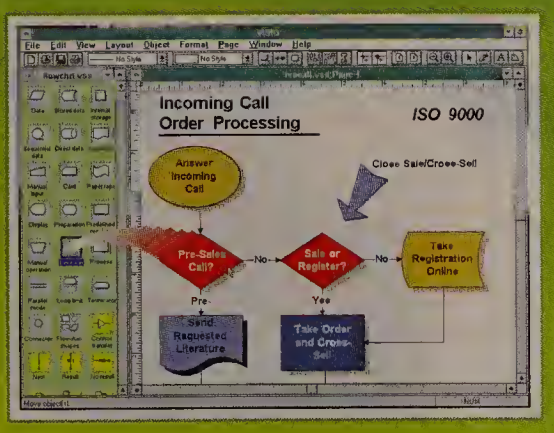
Rep

Do not k

Root canals. Bad haircuts. Business graphics. A few scary things you go through life tryin to avoid. Well, fret no more friend. Visio™ is here. It's graphics software that gives you the courag to do things you've never done before. In a nutshell, it's business drawing for people whos business isn't drawing. What your spreadsheet does for numbers, Visio does for visua communication. With 20 stencils and over 600 pre-drawn SmartShapes™ to choose from you'll be drawing all kinds of stuff without drawing one darn thing. Organizationa charts. Project timelines. Computer network diagrams. Engineering schematics. The bi word here is ENABLING. No other business graphics program lets you do so much, so fas

ess graphics

am.



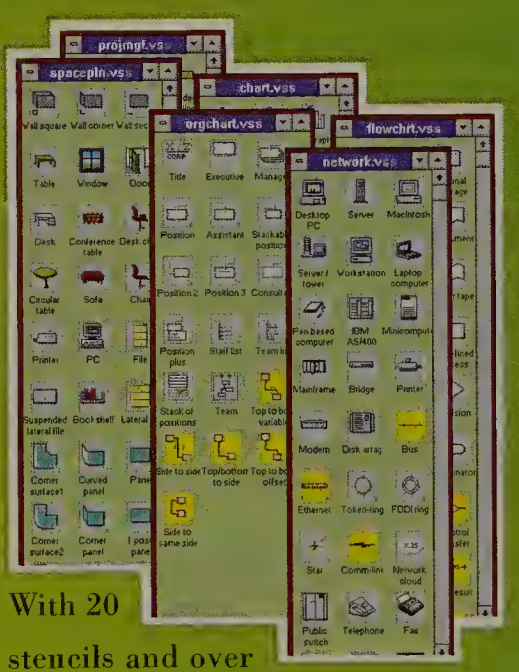
So you don't have a degree in rocket science? Using Visio is cake. Drag the pre-drawn SmartShapes from stencil to page. (In technical terms: Drag. Drop. Done.)

All trademarks referenced herein are held by Shapeware Corp. except for Windows which is a trademark of Microsoft Corp. ©1994 Shapeware Corporation. All rights reserved.

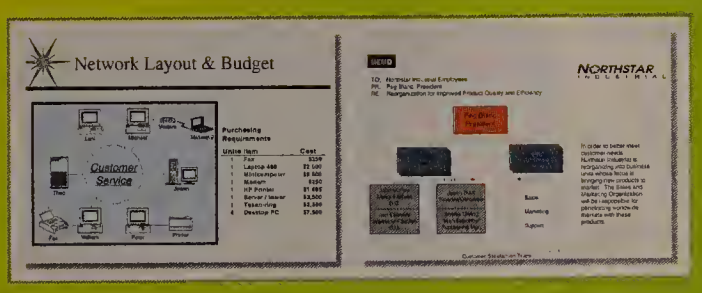
MICROSOFT® WINDOWS® COMPATIBLE

oe afraid.

Visio and your Windows™ software. The perfect marriage. Visio has leading edge support for the OLE 2.0 standard. Which means you can put visuals into presentations, reports, spreadsheets, memos, and other office documents. It's a beautiful thing.



With 20 stencils and over 600 SmartShapes, you can draw project timelines, you can draw flowcharts, you can even draw maps. You can draw, draw, draw till it hurts.



e afraid.

nd with such reckless abandon. Drag it. Drop it. ou got it. The moral of the story? Floss daily, spend little extra on your next haircut and get Visio.

Order today. Call (800) 457-3335, ext. F23 and get Visio for a mere $129. There's no better way to try Visio than to load it up and take it for a spin. Our 60-day money-back offer guarantees you'll love it.

Business drawing for people whose business isn't drawing.™

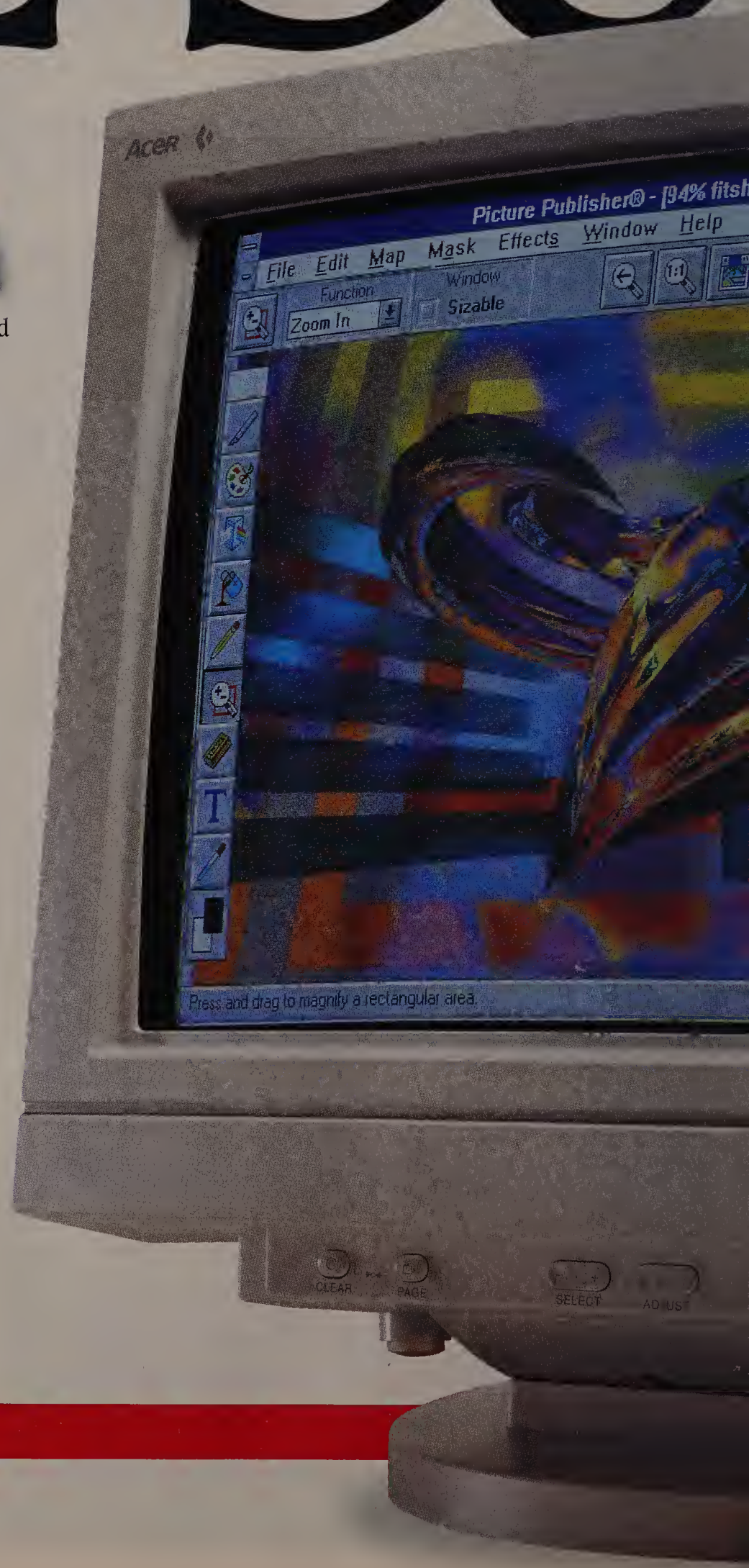
Hz So

High-Performance That Won't Hurt The Environment.

When you demand the highest level of performance and total control in an environmentally sound monitor—get the AcerView™ 76i with innovative on-screen controls. This EPA Energy Star–compliant monitor delivers unsurpassed image quality, ergonomic features and a rapid refresh rate of 76Hz for all resolutions up to 1024 x 768. In fact, *PC World* declared the AcerView 76i a Best Buy for its affordable price, large viewable screen area, energy saving capabilities and convenient controls.

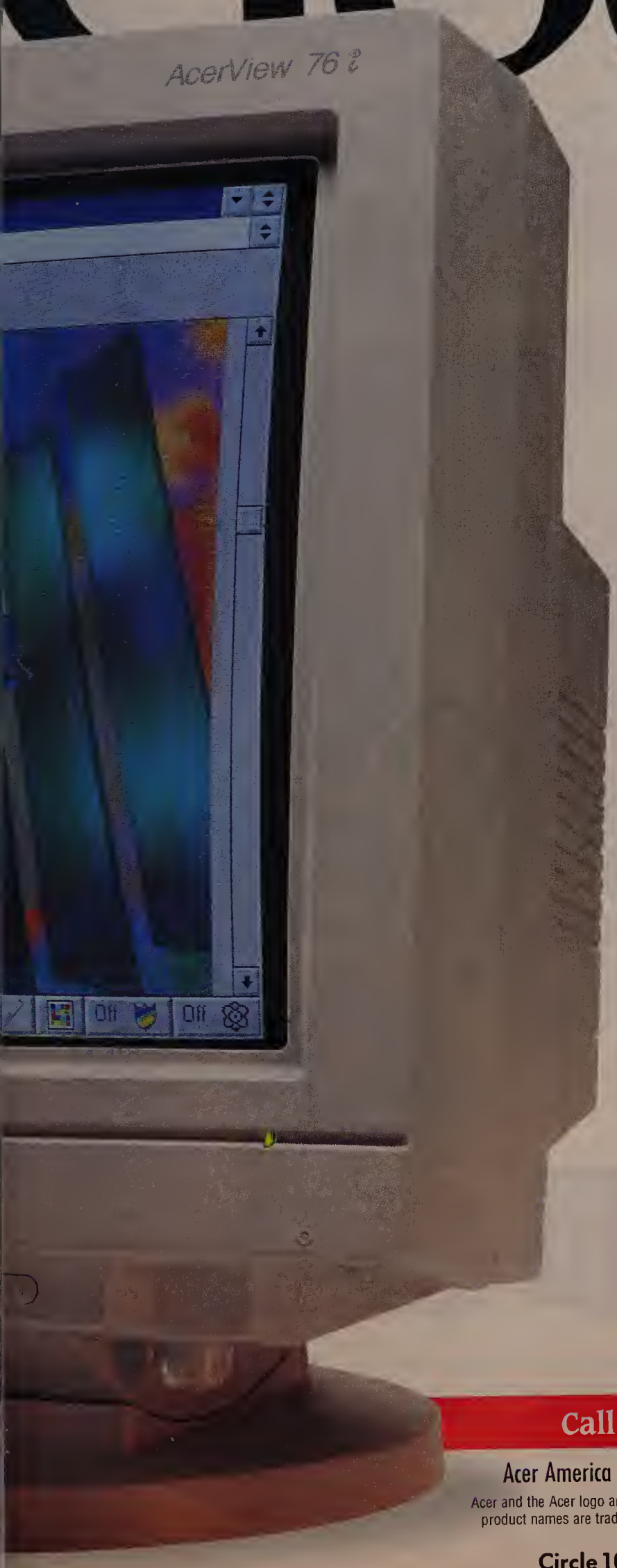
Ready To Take On Demanding Applications.

The AcerView 76i is PC and Macintosh® compatible and the 17" non-glare, superfine dot pitch and high-contrast flat screen makes it perfect for 3-D modeling, DTP, CAD/CAM/CAE and other graphics-intensive applications. Compatibility with VGA, SVGA, XGA, Ultra VGA and all VESA display modes means you can access today's most advanced applications.



ACER COMPUTERS • THE INDUSTRY SOURCE •

Good!



Painless On-Screen Display Controls.

The "i" in the AcerView 76i means intelligence on screen. The iScreen® is Acer's patented on-screen display control technology that lets you adjust brightness, contrast, image position, size and more—you can even degauss your CRT!

Plus the AcerView 76i meets the stringent safety standards it takes to earn an MPR-II rating for safety and low radiation.

Our Reputation Is On The Entire Line.

No matter what your monitor needs are, there's an AcerView monitor that's right for you. The 15" AcerView 56L incorporates sophisticated, low-radiation cathode tubes in a high-resolution color monitor. And if you're looking for quality on a budget, the 14" AcerView 34T or 11DG is the choice for you.

Call us today at 1-800-SEE-ACER for information on our complete line of EPA Energy Star–compliant, high-performance monitors.

Acer®

Call 1-800-551-ACER for a reseller near you

Acer America Corporation • 2641 Orchard Parkway • San Jose, CA 95134 • Fax: 408-922-2953

Acer and the Acer logo are registered trademarks and AcerView is a trademark of Acer America Corporation and Acer, Inc. All other brands and product names are trademarks or registered trademarks of their respective companies. ©1994 Acer America Corporation. All rights reserved

Circle 102 on reader service card

In all respects, it's

"Outstanding" level of performance...

"Win

a

intel inside
pentium
PROCESSOR

On June 28th, PC Magazine announced its Editors' Choice Awards. We'd like to thank them for making the HP Vectra XU PC a winner, and for doing an excellent job of writing this ad. For additional reading materials, call us today at 1-800-322-HPPC, Ext 8518.

nd the Intal logo ara ragesterad tradamarks and Pentium and tha Pentium Procassor logo are trademarks of Intel Corporation. © 1994 Hawlatt-Packard Company PPG406

"The HP Vectra XU PC is a

power user's dream"

"most advanced design *of any system..."*

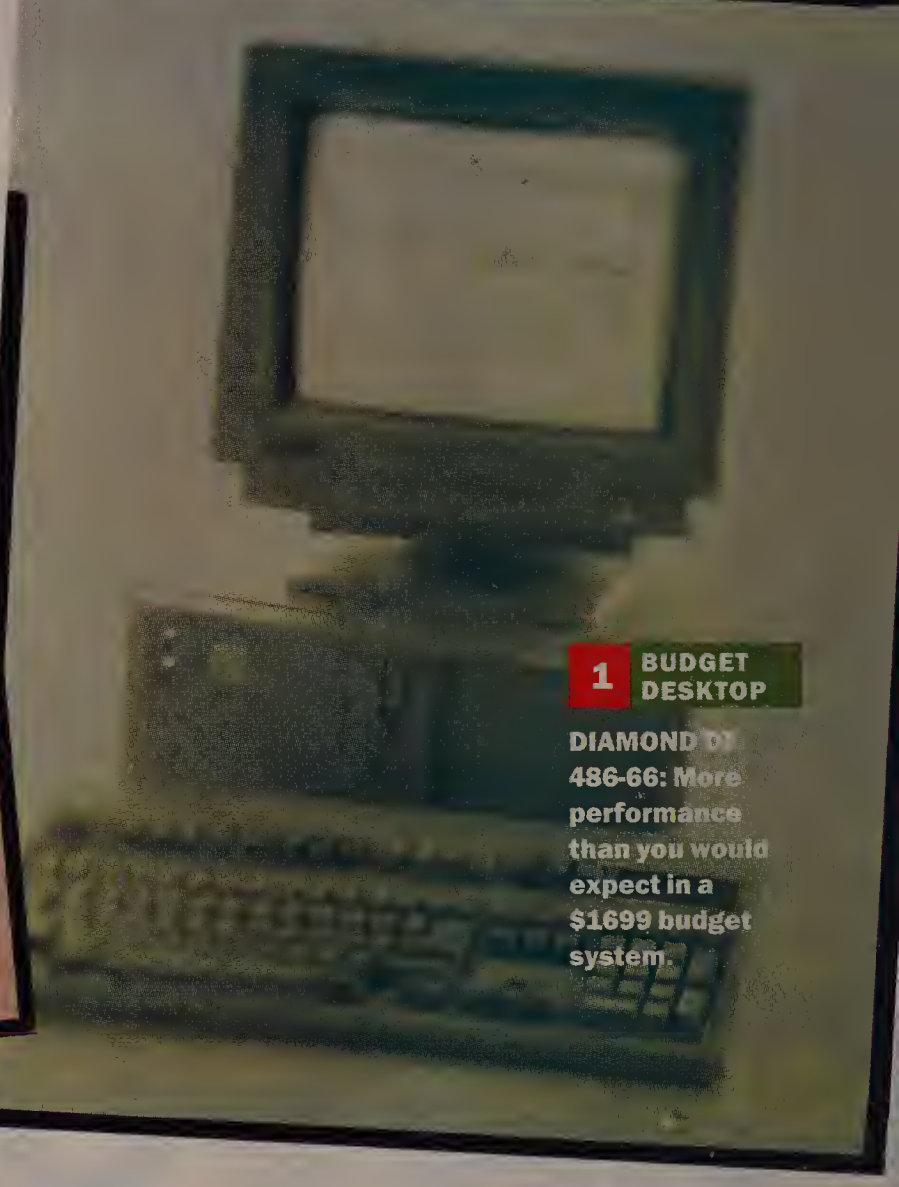
rier"

heration ead *of the pack"*

Believe everything you read.

HEWLETT® PACKARD

Top 20 PCs:

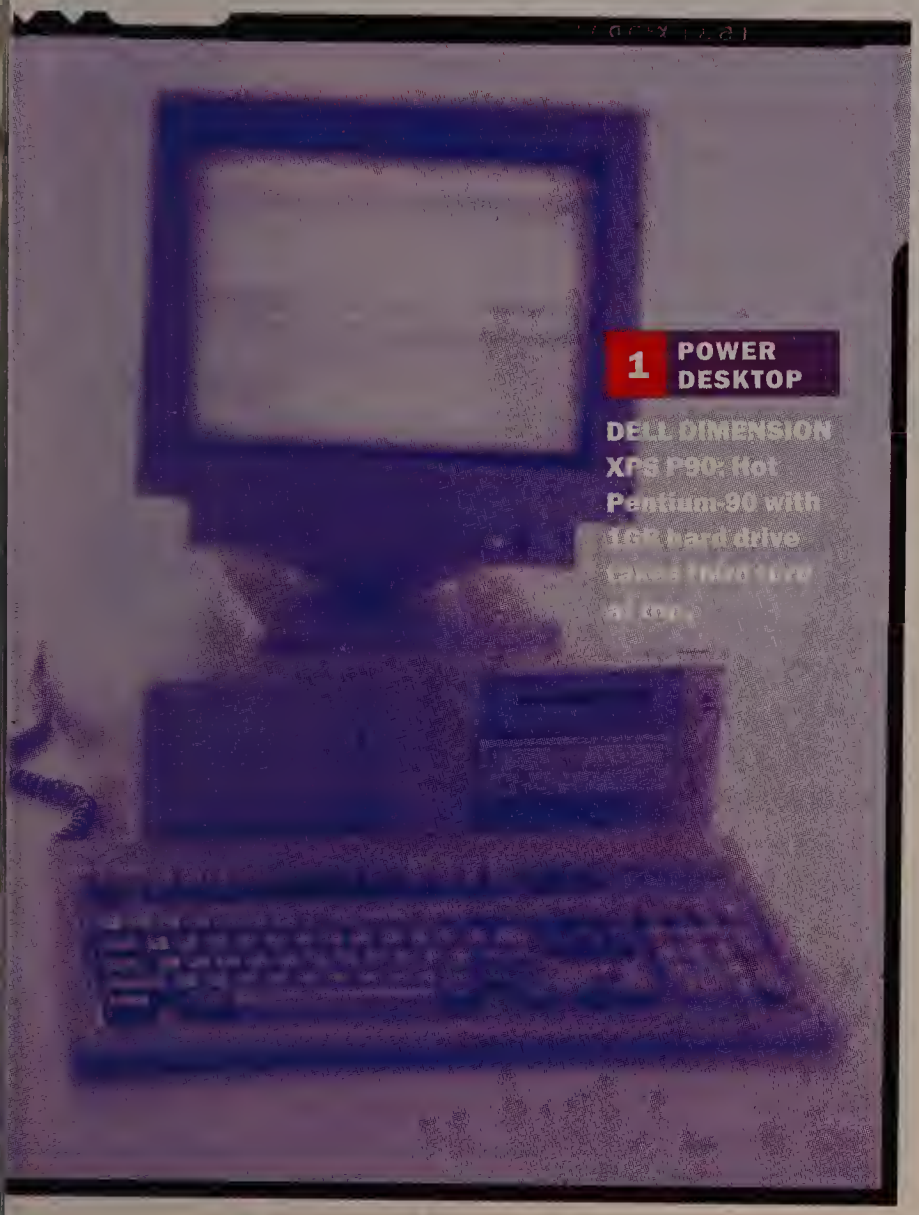


We've tested 224 PCs with 16 different processors. Which offer the best blend of features, performance, and

All right, we admit it—we're guilty. Like most people in the PC world, we tend to use shorthand, referring to a computer by the name of its processor. Unfortunately, that habit casually perpetuates the notion that a system's prowess can best be judged by its CPU. Granted, a powerful processor is fundamental to a fast PC. But that doesn't mean a Pentium-90 guarantees top performance. Factors as mundane as memory configuration and as esoteric as wait states and chipsets affect performance as much as CPU class does. So we've seen such phenomena as a Pentium-66 desktop zipping by its Pentium-90 peers, or a DX2-66 mobile PC outrunning notebooks using the DX4-75.

This Month's Contenders pg. 135 • **Power Desktops** pg. 136 • **Budget Desktops** pg. 144 • **Mobile PCs** pg. 148

Beyond the CPU



price? AT&T's Globalyst 200 (486DX2-50), Diamond's DT 486-66, Dell's Pentium-90, and IBM's ThinkPad 500.

Adding to the confusion, there's a wide variety of processors—16 of them represented in our Desktop and Mobile Top 20s this month. It's easy to see why there's tremendous performance overlap between systems with different CPUs.

The most striking example of the ever-shifting silicon is Intel's DX4-100. More than one-quarter of the systems in this roundup—six desktops and a notebook—have this processor, and they produced wildly differing test results. Ares's DX4-100 tower performed on a par with a very fast 486DX2-66, while the NEC and MicroTech DX4-100 desktops zipped past most of the 60-MHz and 66-MHz Pentium systems we've reviewed. In fact, NEC's Image 4100es even

• Complete Rankings pg. 165 • By Bryan Hastings TESTING BY DEAN ANDREWS, ULRIKE DIEHLMANN, AND SUSAN SILVIUS

bested some of the slower Pentium-90s we've tested. This is a stunning power play from a system using a processor originally intended as an affordable alternative to the Pentium-60. Small wonder that half of the dozen DX4-100 desktops we've tested in the last few months appear on our Power and Budget Desktops Top 20s. The Image 4100es falls just one place short of a Power Desktop Best Buy, landing in an area dominated by Pentium-66 and Pentium-90 computers.

You Can't Tell the Players Without a Program

If you can't judge a system's performance by its processor, how *do* you pick a fast PC? A good place to start is with the performance ratings listed in our Top 20 charts. We provide a neat summation of the results of tests that use seven popular Windows- and DOS-based applications.

When it comes to gauging value, an even more important figure in the Top 20 is the overall rating, which takes into account all the critical aspects of the system: price, performance, design, expandability, and service and support. The news in the overall ratings column is especially good. Since we started the Top 20 roundups last February, the overall value ratings of Top 20 PCs in all categories—desktop and mobile, power and budget—have steadily increased. This climb reflects across-the-board improvements in performance and features. For example, for about the same price you would have paid in February, you can now buy a faster system with a larger hard disk and a CD ROM drive.

Best Buy Pentium—On a Budget

Some new faces have appeared among our budget desktop Best Buys. The new king is Diamond's DT 486-66, reviewed this month. This fast 486DX2-66 system comes with just the basics, but where else can you find an expandable PC that outpaces even a few Pentium-60s and costs only $1699? In addition, a price drop of about $250 levers the remarkable Austin Power System 60, reviewed in March, to number five on our Budget chart. At $2258, this Pentium-60 earns our first-ever budget Pentium Best Buy.

Two of this month's notebook entries, AT&T's Globalyst 200 (486DX2-50) and the IBM ThinkPad 500, are our new top power and budget mobile PCs. You get it all with the Globalyst: thoughtful design, solid battery life, great service and support, and blazing speed that surpasses that of Ambra's DX4-75 notebook, the second-place power mobile Best Buy. Among budget portables, Big Blue makes yet another strong showing. Bumping its 486SX-33 sibling down to number two, the ThinkPad 500 subnotebook, based on IBM's own 486SLC2-50 processor, shoots directly to the top with a low $1798 price and an outstanding feature set. Its performance equals that of the typical 486SX-33 notebook, you get a remarkable 5 hours and 40 minutes of battery life, and the unit has an exceptionally comfortable keyboard for a subnote. Of course, you also get IBM's legendary service and support.

Meanwhile, Dell's Pentium-90 compact holds the top power desktop position for the third month in a row, with a combination of fabulous performance, top-notch components (including a huge 1GB hard drive), and excellent support. Dell dropped the price on the Dimension XPS P90 to $3828 from an already low $3999. Austin's P5-66 tower, reviewed this month, zips to a third-place power desktop Best Buy. This Pentium-66 PC outperformed most of the Pentium-90 systems we've reviewed and sells for only $3298.

Pick a PC, Any PC

If there's a particular desktop or mobile PC you want, chances are we've evaluated it. Now you can quickly track down its review—even if it didn't make the Top 20. This month, starting on page 165, we list all the machines we've reviewed since our Top 20s premiered in February. And that's not all. Reader response to the Top 20 roundups has been tremendous, and we get many calls asking about systems we haven't had a chance to review. Our answer? Starting in October, we'll increase the number of machines we review, putting *35* new systems through their paces every month.

Bryan Hastings is an associate editor for PC World. *He can be reached on PC World Online (see page 10 for contact information).* PC World *staff members Mike Desmond, Rex Farrauce, John Goddard, Anita Hamilton, Caroline Jones, Owen Linderholm, Melissa Riofrio, and Susan Silvius contributed to this article.*

Buying Smart: Consumer Tips

Avoid Orphaned Notebooks

Most mobile PCs sold by smaller companies aren't manufactured by their vendors. Never buy without knowing who made your model. Find out if the notebook maker can provide alternate sources for replacement batteries, converters, and other parts in case your vendor stops supporting the product or goes under. This is especially important if you're buying a used notebook.

Get It in Writing

Before buying a PC, get a written copy of all configuration details from the vendor: RAM, secondary cache, graphics accelerator and memory, and so forth. Use this information to comparison shop with other vendors.

Use a Credit Card

Use a credit card unless you already have a credit arrangement with the vendor. In case of dispute, the credit card company can help mediate or give a refund if you fail to receive a product.

Call 900/903-2972 and use the fax reprint numbers to order an instant fax of up to three individual systems' capsule reviews or one capsule plus features table and test reports ($4.95). To order a month's complete review ($9.95 each), enter the number for that month: December 3012; January 3001; February 3002; March 3003; April 3004; May 3005; June 3006; July 3007; August 3008; September 3009. For a list of all systems tested by the PC World Test Center for Top 20s ($4.95), enter 7. Touch-tone phone required; charges will appear on your telephone bill.

For more information about all products in this article, circle reader service no. 905.

This Month's Contenders

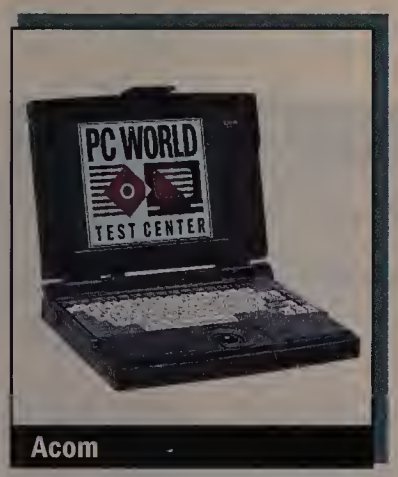
Our look at this month's contenders for the Top 20 Power and Budget Desktops and the Top 20 Mobile PCs. Icons show where systems placed on the Top 20 charts.

Acom Patriot 4000

PROS: Great performance, large hard disk, built-in audio

CONS: Short battery life, dull screen colors, heavy

Acom's 486DX2-66 Patriot 4000 offers tremendous speed, especially for its $2780 price—this system outperformed the typical DX4-75 notebook. It comes with 8MB of RAM and an exceptionally roomy 330MB hard drive. You also get a PCMCIA Type III slot, plus 8-bit audio and a speaker, which make it simple to add voice and sound to documents. Furthermore, we found both the keyboard and the integrated trackball comfortable to use for extended periods.



Acom

The Patriot is by no means perfect, however. For example, its battery conked out after only 1.75 hours in our run-down tests. Also, the unit's 9.5-inch passive color screen won't be mistaken by anyone for the clearly sharper dual-scan color, and setting the desired contrast and brightness is difficult as well. Finally, this 8.4-pound system is somewhat larger and heavier than most notebooks these days. Support policies—such as a one-year warranty—are run-of-the-mill, though Acom promises a fast two-day turnaround on repairs.

The very short battery life and slightly washed-out screen colors worked to keep the Patriot off the power side of our Mobile Top 20 list, but you'd be hard-pressed to find more portable power for the money. In fact, if this notebook's price were just a bit lower, it would have been an earnest contender for our Budget Mobile PCs chart. *Acom, 800/898-2665, 408/727-8577* **Reader service no. 719**

Ambra D466I/VL

PC WORLD TOP 20 — 12 BUDGET DESKTOP

PROS: Fast for a DX2-66, inexpensive, convertible to PCI, 24-hour tech support

CONS: None

If the D466I/VL is any indication of the company's current direction in desktop equipment, it's clear that Ambra still has the talent for turning out powerful, inexpensive office PCs. Intriguingly, this compact's $2460 price qualifies it as a budget system, yet in performance it's close to the typical Pentium-60 desktop, especially in our Paradox for Windows benchmark. And the configuration is particularly generous for a budget box: You get 16MB of RAM, 256K of secondary cache, a 540MB hard drive, a 15-inch monitor, and a 2MB VL bus graphics adapter.

The cover slides off to reveal a clutter-free interior instead of the snarl of cables all too common in inexpensive PCs. The D466I/VL also has exceptional expandability for a compact. You get three free drive bays, and since the VL bus video and IDE drive adapters are both integrated, all five expansion slots are free for the filling. Most unusual is the low-cost option to convert this VL bus system to PCI. The Ambra D4100I/VL's 16-bit and VLB expansion slots are on a riser card that plugs into a slot on the motherboard. Whether you buy this VL bus system or its PCI counterpart, Ambra will sell you a conversion to the alternate bus setup for $99. This kind of flexibility is a boon that you don't get with many machines. It enables you to choose your setup today without having to worry about future hardware developments rendering your choice obsolete.

Ambra D466I/VL

Service policies are solid: You get a one-year warranty and a 30-day money-back guarantee, and you pay only $29 for the first year of on-site service. In addition, the company has a 3-day turnaround policy on factory repairs, and IBM provides nonstop phone tech support. The D466I/VL offers fast performance in a budget compact system that's uncommonly upgradable. It earns its solid position on our Budget Desktops Top 20. *Ambra Computer, 800/252-6272* **Reader service no. 720**

Ambra D4100I/VL

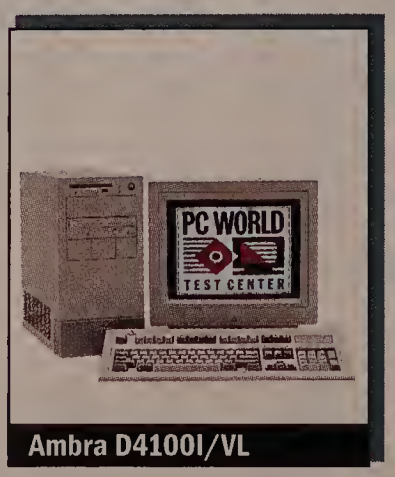
PC WORLD TOP 20 — 15 POWER DESKTOP

PROS: Fast, upgradable to PCI, 24-hour tech support

CONS: None

Ambra's second entry this month, the D4100I/VL, is priced and configured effectively to appeal to power users. What do you get for the $3034 this system will set you back? Surprising speed, for one thing. This DX4-100 minitower with 16MB of RAM and 256K of secondary cache emphatically outperforms the typical DX4-100 and Pentium-60 PC.

You also get a solid feature set, including a CD ROM drive, a sound card, and speakers. In addition to the full complement of multimedia trappings, you get a 540MB hard drive, and the system's 15-inch monitor and 2MB VL bus video controller team up nicely for comfortable viewing in super-VGA resolutions.



Ambra D4100I/VL

Moreover, there's all kinds of room inside the case for adding expansion cards: Seven free slots is a generous helping—even for a minitower—and three free drive bays is good for a system that already has a CD ROM drive installed. And as with its budget-priced D466I/VL sibling, reviewed above, the D4100I/VL's expansion slots are on a riser card; for a reasonable $99 you can switch from VL bus to PCI bus or vice versa. Finally, this nicely designed system is backed by sound support policies, including a year of on-site service for $29 and nonstop tech support. If you want a fast multimedia system with a highly flexible upgrade path—at a good price—check out the D4100I/VL. It has the solid value it takes to earn a spot on our Power Desktops Top 20. *Ambra Computer, 800/252-6272* **Reader service no. 721**

THE PC WORLD TOP 20

POWER DESKTOPS

1 Dell Dimension XPS P90
Pentium-90 with 1GB hard disk.

New this month · Up from last month · No change from last month · Down from last month

BEST BUYS

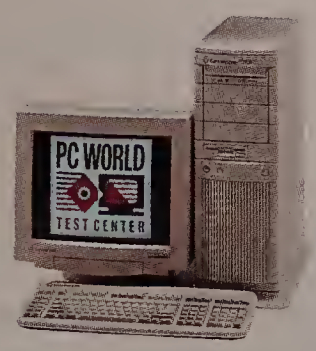
		Last month	Months on list	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)	Bus slots
1	Dell Dimension XPS P90	1	3	97	93	76/83	$3828	Pentium-90	16	1080	ISA, PCI
2	Zeos Pantera 90	2	2	96	102	72/82	$3595	Pentium-90	16	528	ISA, PCI
3	Austin P5-66	–	1	94	94	70/80	$3298	Pentium-66	16	520	ISA, PCI
4	Zeos Pantera 66	3	4	92	89	72/82	$3395	Pentium-66	16	528	ISA, PCI
5	Gateway P5-90	4	3	91	92	73/77	$3830	Pentium-90	16	540	ISA, PCI
6	NEC Image 4100es	–	1	91	88	81/77	$3813	DX4-100	16	540	ISA, VLB
7	Gateway P5-66	5	4	90	83	73/77	$3430	Pentium-66	16	540	ISA, PCI
8	DECpc XL590	–	1	90	97	81/83	$5098	Pentium-90	16	540	ISA, PCI
9	IBM PC Company ValuePoint P/60D	6	8	90	80	83/78	$3849	Pentium-60	16	424	ISA, PCI
10	Polywell 586-90VIP	9	2	89	99	69/71	$4089	Pentium-90	16	540	PCI, VLB[2]
11	Micron P90PCI PowerStation	7	2	89	98	65/86	$4599	Pentium-90	32	540	ISA, PCI
12	Micron 4100PCI Magnum	8	2	89	80	65/86	$2599	DX4-100	8	420	ISA, VLB
13	CompuAdd CP60p	–	1	88	76	78/75	$3407	Pentium-60	8	540	ISA, PCI
14	Gateway P5-60 Best Buy	10	4	88	70	73/77	$2545	Pentium-60	8	540	ISA, PCI
15	Ambra D4100I/VL	–	1	88	82	66/70	$3034	DX4-100	16	540	ISA, VLB
16	IBM ValuePoint Performance Series	11	2	87	69	83/78	$4168	DX4-100	16	527	ISA, VLB
17	Zeos 486DX2-66	12	4	87	67	72/82	$2537	486DX2-66	8	528	ISA, VLB
18	ALR Evolution V	14	8	87	81	78/75	$3761	Pentium-60	16	540	ISA, VLB
19	Insight PCI P66 SCSI	–	1	86	90	60/66	$3678	Pentium-66	16	1080	ISA, PCI
20	Micron P60 PCI PowerStation	13	5	86	75	65/86	$4138	Pentium-60	16	540	ISA, PCI

[1] Call 900/903-2972 and use the fax reprint numbers to order fax copies of system reviews. You may order an instant fax of up to 3 individual systems' capsule reviews or 1 capsule plus features table and test reports ($4.95); a complete month's review ($9.95 each; January 3001, May 3005, June 3006, July 3007, August 3008, September 3009); and a list of all systems

2 Zeos Pantera 90
$3595, super performance.

3 Austin P5-66
$3298 ultra-hot Pentium-66.

4 Zeos Pantera 66
Balanced price/performance.



5 Gateway P5-90
$3830 with 17-inch monitor.

Monitor size/ dot pitch	Vendor contact number	Issue reviewed	Fax reprint number [1]	Comments
15"/.28	800/289-3355	July	3112	Pentium-90 with top-notch mix of power, features, and price is a three-time no. 1.
15"/.28	800/554-5220	Aug	3123	The fastest system we've tested—a real number cruncher.
15"/.28	800/752-1577	current	3132	Pentium-66 is full of features; faster than many Pentium-90s.
15"/.28	800/554-5220	June	3091	Fast Pentium-66 is a good blend of power and price.
17"/.26	800/846-2000	July	3114	Powerful graphics workstation with big 17-inch monitor.
15"/.28	800/632-4636	current	3133	Fastest DX4-100 we've ever tested; great all-around machine.
17"/.26	800/846-2000	June	3093	Cheaper but slower 66-MHz version of no. 5 Best Buy.
17"/.26	800/722-9332	current	3134	Fast, high-quality, loaded with features, but expensive.
15"/.28	800/772-2227	Jan	3041	IBM quality, service, and reliability meet in basic Pentium-60. On Top 20 for eight months.
15"/.28	800/999-1278	Aug	3126	Second-fastest system we've tested. Price dropped more than $100.
15"/.28	800/438-3343	Aug	3124	Third-fastest system we've tested; loaded with RAM; would make a great server.
14"/.28	800/438-3343	Aug	3125	Low-priced DX4-100 is a solid value.
15"/.28	800/627-1961	current	3135	Good Pentium-60 workstation could use more RAM.
14"/.28	800/846-2000	May	3127	Slowest Pentium on Power list is also cheapest.
15"/.28	800/252-6272	current	3136	Loaded DX4-100 at a good price.
17"/.28	800/772-2227	Aug	3128	High-quality DX4-100 has surprisingly high price.
14"/.28	800/554-5220	June	3095	Fastest DX2-66 we've tested; also the cheapest system here.
14"/.28	800/444-4257	Jan	3044	Former top Best Buy is starting to look long in the tooth.
15"/.28	800/998-8011	current	3137	Fast Pentium-66 with huge hard drive makes a good database workstation.
17"/.26	800/438-3343	May	3094	Basic Pentium workstation with a good monitor, but it's not cheap.

tested by the PC World Test Center for the Top 20s ($4.95). Touch-tone phone required. Charges will appear on your telephone bill.

[2] With ISA bus.

AT&T Globalyst 200 (486DX2-50)

PC WORLD TOP 20
1 POWER MOBILE PC

PROS: Strong performance and support policies, well designed **CONS:** Power management too easy to shut off

Most people know AT&T as the phone company, but that colossus, teamed up with NCR, turns out some pretty classy notebook computers. In fact, the company's Globalyst 200 (486DX2-50) earns our top power mobile Best Buy this month.

This notebook rates very high in nearly all respects. Take its astonishing performance. Configured with 8MB of RAM, the Globalyst breezed by many DX2-66 and even several DX4-75 notebooks. This kind of showing reinforces our contention that picking your PCs based on the system's processor alone can be a huge mistake. Design and implementation are critical, as this AT&T unit demonstrates. But high-powered performance is not all you get with this world-class traveler. The $4105 Globalyst is a product of thorough, thoughtful design, from its beautiful 9.5-inch active-matrix color screen, to its sturdy sculpted case, to AT&T's excellent online help and complete, well-illustrated manual. The full-travel keys feel solid, and there's space in front of the keyboard for those who like to rest their palms while typing. The trackball is centered in front of the keypad for easy access with either thumb. While many high-performance notebooks have battery lives that run from short to shorter, the Globalyst managed a quite respectable 3.5 hours on its nickel-metal-hydride (NiMH) battery pack. And at 7.4 pounds traveling weight, the Globalyst 200 is easy to carry.

AT&T Globalyst (486DX2-50)

The system's 250MB removable hard drive is decent even by desktop standards, and the 1MB video adapter lets you display images at 1024 by 768 resolution on an external monitor at 256 colors. The notebook comes with PCMCIA Type II and Type III slots; a docking station is optional. AT&T Mail Access Plus E-mail software and BitFax fax software are preinstalled.

Did we mention service and support? When you pay a high price for a top-quality mobile setup, you have every right to expect fine support. Fortunately, AT&T's policies are very strong, including a one-year warranty with free replacement service and 24-hour toll-free tech support.

In the midst of all this high praise, we have only one quibble. It's all too easy to turn off the power management accidentally—just press the <Fn> and <F3> keys at once. That wouldn't be a problem, but there's no status indicator to tell you whether the feature is active. On the upside, the power management menu is easy to find and set with flexible options aplenty.

Add together this mobile's terrific performance, features, and support, and you get one of the most capable portable packages we've ever seen. If you can afford to part with over $4000 for a mobile PC, you'd be hard put to find a better system than this number one power Best Buy. Now if only the company offered a convenient plan so owners of other vendors' notebooks could switch to AT&T... *AT&T Global Information Solutions, 800/637-2600, 513/445-5000* **Reader service no. 722**

AT&T Globalyst 200 (486SX-33)

PC WORLD TOP 20
7 BUDGET MOBILE PC

PROS: Nicely designed, strong support
CONS: Sluggish performance

If the Globalyst 200 (486DX2-50) sounds good but you're on a budget, take heart. For $2700 you can get many of the same features that make AT&T's DX2-50 notebook so attractive—comfortable keyboard and trackball, stylish case, removable hard drive, and fine service and support.

What do you sacrifice to save $1400? You get a smaller 170MB hard drive and a passive color screen—also 9.5 inches—with decent but much paler colors than its active-matrix sibling displays. The most dramatic difference is in performance—with its 486SX-33 processor and 4MB of RAM, this Globalyst finished well behind a typical mobile PC of its CPU class. The lower power requirement, however, translates into more than 4 hours of battery life, according to our rundown tests.

AT&T Globalyst (486SX-33)

This notebook isn't a powerhouse, but the combination of reasonable price, intelligent design, decent battery life, and classy service and support land the Globalyst 200 (486SX-33) in the budget section of our Mobile PCs Top 20. *AT&T Global Information Solutions, 800/637-2600, 513/445-5000* **Reader service no. 723**

Austin P5-66

PC WORLD TOP 20
3 POWER DESKTOP

PROS: Lightning fast, very upgradable
CONS: None

From deep in the heart of Texas comes a *big* machine, imposing in both size and performance. Sure, we expected decent speed from this full-size multimedia tower with its Pentium-66 processor, 16MB of RAM, and 256K of secondary cache, but this giant takes seven-league steps. The Power-66 outscored most Pentium-90s in our tests, climbing to third place on our Power Desktops Top 20 chart.

The system's component lineup is as impressive as its performance. Austin throws in a CD ROM drive and sound card, although no speakers or earphones came with our test unit. The 520MB hard drive should be able to handle a herd of disk-hungry sound and video files. A 2MB PCI video controller and 15-inch monitor cap off the hardware lineup. Austin also provides Microsoft Works for Windows.

Austin

There's room left to add to the system: You get one PCI and three 16-bit slots free, along with another slot you can fill with either a 16-bit or a PCI card. The count of free drive bays is a generous five, thanks to the system's size and its space-saving combo floppy drive, which handles both

THE NEW WORKPLACE™

[Sharp JX-9460PS *600 dpi Laser* Printer]

"Wow, who said we couldn't afford output this good"

Now, any size office can afford the near-typeset quality text and graphics that only a true 600 dpi laser printer can provide. The JX-9460PS is PostScript® and PCL5 compatible, so you get smooth greys and crisp line art. And, thanks to a high out-put engine and RISC processor, it delivers 6 fast pages per minute. The JX-9460PS comes with easily installed Windows® and MAC®* software so you can be up and printing in no time. There's even a toll-free support line. And the JX-9460PS is economical. An energy-saving sleep mode saves on electrical bills, and long-life supplies give you one of the lowest per-copy and total-life costs available. All of which explains why the JX-9460PS received BIS' outstanding printer award along with NSTL certification. The Sharp JX-9460PS. Your documents have never looked so good for so little.

1-800-BE-SHARP

Or FastFax 201-529-9113
Product ID# 024

SHARP®
FROM SHARP MINDS
COME SHARP PRODUCTS™

LCD

COPIERS • FACSIMILE • LASER PRINTERS • NOTEBOOK COMPUTERS • COLOR SCANNERS • PERSONAL DIGITAL ASSISTANTS • CALCULATORS
CORDLESS TELEPHONES • TYPEWRITERS • WORD PROCESSORS • WIZARD® ORGANIZERS

Also see the JX-9400 and JX-9400H low cost 300 dpi laser printers. ©1994 Sharp Electronics Corporation. PostScript® is a registered trademark of Adobe Systems, Inc. Windows® is a registered trademark of Microsoft Corporation. Mac® is a registered trademark of Apple Computers, Inc. *Requires Optional Apple Talk Interface.

Circle 230 on reader service card

Ten hours per day.
One hundred and thirty words per minute.

Introducing the MultiSync® Value Series Monitors. The affordable solution for those who make your business run.

They're the people you count on to get the job done. From secretaries to shipping, they need all the help you can give them. Luckily, the 15" (13.8" diagonal viewable area) MultiSync® 3V and the new 14" (13" diagonal viewable area) MultiSync 2V give them the bright, sharp images you'd expect from an NEC MultiSync monitor. You also get MPR II compliance, Mac and PC compatibility, high refresh rates and resolutions up to 1024 x 768 NI, all with a 3-year limited warranty. It's more than you'd expect at such a great price. But then again, you're probably used to getting the most for your money. Questions? Call 1-800-NEC-INFO. Or, for information via fax, call 1-800-366-0476 and request Document No. 153501 and No. 143201. **The easiest monitors to live with for hours and hours: Ours.**

MultiSync 2V

NEC

Optional cable adapter, required for Macintosh connection, available free from NEC. MultiSync is a registered trademark of NEC Technologies, Inc. The Energy Star emblem does not represent EPA endorsement of any product or service. ©1994 NEC Technologies, Inc.

Circle 203 on reader service card

standard formats in a single half-height unit. Austin's service-and-support policies are good, with a two-year warranty, free on-site service for the first year, and nonstop toll-free tech support—a recent addition. You also get a 30-day money-back guarantee and a 2-day turnaround policy on repairs.

Simply put, the Austin P5-66 system is a big value for power users. With no major shortcomings and an attractive $3298 price, it earns the number three power desktop Best Buy—and our unreserved recommendation. *Austin Computer Systems, 800/752-1577* **Reader service no. 724**

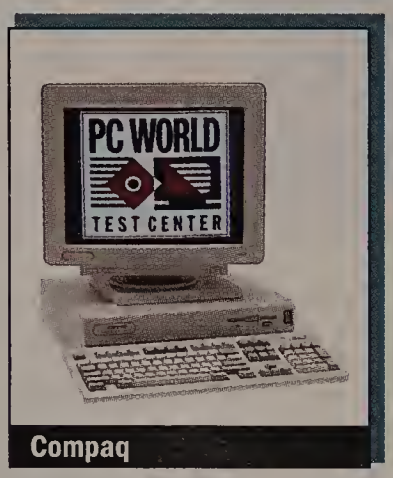
Compaq ProLinea 4/100 Model 525

PROS: Large monitor

CONS: Limited expandability

We found a lot to commend in Compaq's latest compact, including a spacious 530MB hard drive and a 17-inch monitor coupled with an integrated 1MB local bus video controller. And you get TabWorks, a Windows Program Manager interface with a tabbed-notebook metaphor that makes every application easy to access for newcomers and veterans alike.

The test scores of this ProLinea DX4-100 with its 8MB of RAM and 128K of secondary cache provide no surprises. Performance is as solid as you would expect from a 100-MHz PC. But even with the hard drive adapter and video controller integrated into the motherboard, the ProLinea 4/100 is still crowded inside. Only three expansion slots and one externally accessible drive bay remain available for your use.



Compaq

Compaq's service and support is excellent. Tech support hold times are relatively short, and you get a three-year warranty, round-the-clock phone support, and free on-site service for the first year. Respondents to our Service and Reliability Monitor rate the company very favorably. The online documentation and the manual are both topflight.

So how does this compact stack up overall? $3548 is a fairly stiff price to pay for a DX4-100 in this configuration. But if a large monitor, great documentation, excellent service and support, and most of all, Compaq's superb reputation are at the top of *your* list, it may not bother you that this system doesn't quite make ours. *Compaq Computer, 800/345-1518, 713/378-8820* **Reader service no. 725**

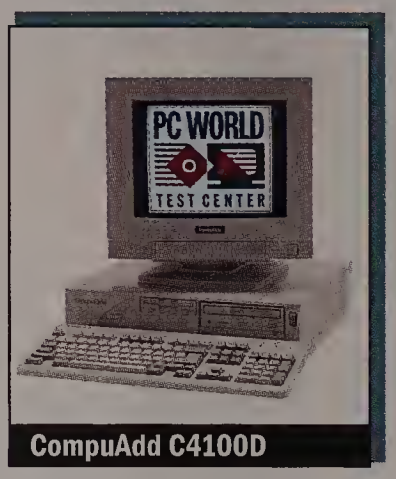
CompuAdd C4100D

PROS: Low price

CONS: Lacks expandability

This low-cost, low-profile desktop not only comes with the usual multimedia hardware—CD ROM drive and sound card, pair of speakers, and microphone—it also comes with several CD ROMs, including a dictionary, a home CAD program, and a disk packed with clip art. The $2691 C4100D has 8MB of RAM, a respectable 340MB hard drive, and a 1MB graphics accelerator. The only thing multimedia users may hanker after is a monitor larger than the 14-incher supplied with the system.

The CompuAdd C4100D is an attractive deal, but it comes up short in two categories. For one, this system's expandability is limited, with only a single free drive bay (externally accessible) and three free expansion slots, two of which are crowded by drive cables. To be fair, one drive bay is already being used for the CD ROM drive, so you won't have to worry about having space to add one. But the C4100D finished our test suite behind the typical DX4-100 system, so don't expect top performance. Buying the system with a filled-out 256K secondary cache would bump up performance, but only slightly.



CompuAdd C4100D

For another, CompuAdd's service and support is basic fare. Toll-free phone support is available for a reasonable 15 hours a day but just on weekdays. Feedback to our Reliability and Service Monitor has been generally positive. All in all, CompuAdd's C4100D is a capable multimedia system at a competitive price. It doesn't lead the business computer pack, but it certainly warrants consideration if you're in the market for a high-end home computer. *CompuAdd, 800/627-1961, 512/250-1489* **Reader service no. 726**

CompuAdd CP60p

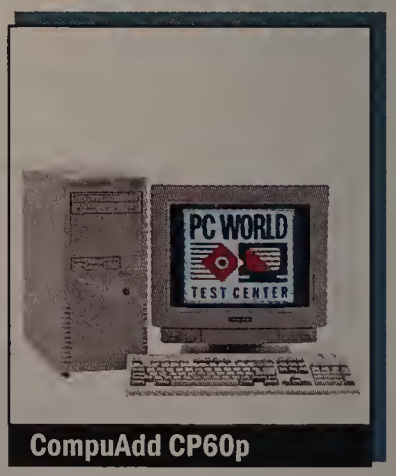
PC WORLD TOP 20
13 POWER DESKTOP

PROS: Fast for a Pentium-60, nice software bundle

CONS: None

If you want more power and high-end features in a CompuAdd system than the company's C4100D DX4-100 provides and you don't mind paying more for them, check out CompuAdd's Pentium-60 offering—in our book it's a much better value for your business dollar. And it provides the same multimedia capabilities its DX4-100 cousin does.

This $3407 tower is surprisingly speedy, even in a fairly pedestrian configuration of 8MB of RAM and 256K of secondary cache. It decisively outperformed the typical Pentium-60. This tower is also well fortified with peripherals. The CD ROM drive and 16-bit sound are complemented by a roomy 540MB hard drive and high-resolution video. You get a 2MB Diamond Stealth PCI graphics card and a 15-inch monitor. CompuAdd also tosses in a raft of software, including the American Heritage Dictionary on CD ROM, a home design package, several hundred scalable fonts, and thousands of clip art images. The only noticeable omission—speakers and a microphone—are optional. Expandability is quite respectable on this medium tower PCI system—you get four free drive bays and five free expansion slots.



CompuAdd CP60p

WinBook XP

Highest quality, best features, lowest price!

Speed and Power

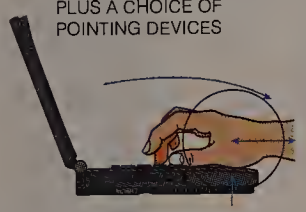
SUPERFAST INTEL DX4-75MHz WITH LOCAL BUS VIDEO ACCELERATED GRAPHICS, UP TO 32MB RAM AND HARD DRIVE CAPACITY TO 520MB

Your Choice...

CHOOSE THE STANDARD TRACKPOINT-LIKE POINTING DEVICE OR AN OPTIONAL DUAL-BUTTON TRACKBALL

Great Ergonomic Features

SUPERB ERGONOMICS AND KEYBOARD WITH FULL SIZE KEYS, SLOPING WRIST REST PLUS A CHOICE OF POINTING DEVICES



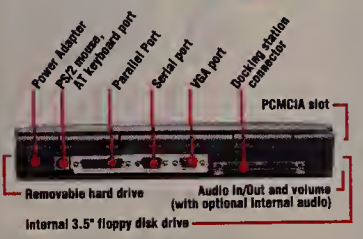
WinBook®

COMPUTER CORPORATION

a subsidiary of Micro Electronics, Inc.

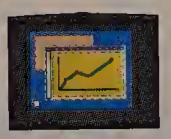
Longer Battery Life

LONGER BATTERY LIFE WITH TEN-CELL 2500mA NiMH BATTERIES



Upgradability

UPGRADABLE SCREEN AND USER-EXPANDABLE RAM, REMOVABLE HARD DRIVE AND PCMCIA CAPABILITIES



PCMCIA Expansion

TWO TYPE II OR ONE TYPE III INDUSTRY-STANDARD PCMCIA SLOT

The 75MHz WinBook XP

The only feature we forgot was the high price tag.

PC MAGAZINE EDITORS' CHOICE™

August 1994

WinBook XP DX2/50 4/260 Monochrome

Full of features and plans for a big future—the 75MHz WinBook® XP brings you up to a new height in performance and value. The 32-bit local bus video Rocketchip accelerator boosts your graphics performance level and a ten-cell NiMH 2500mA battery pack lets you run power-hungry programs longer. Plus an LCD indicator lets you monitor functions at a glance. You get the same unique ergonomic features that critics raved about with the original WinBook—full size keys, a sloping wrist rest, and now your choice between the TrackPoint™-like pointing device or an optional 19mm dual-button trackball.

WinBook XP components are upgradable with user-upgradable RAM to 32MB, upgradable screen, removable hard drives to 520MB capacity and PCMCIA capabilities. Options include a 14.4 fax/voice/data modem, internal audio and docking station.

Along with your WinBook XP, you get excellent support, a 30-day money-back guarantee, quick service turn-around, a one-year limited warranty on parts and labor plus toll-free technical support for the life of your computer. Your purchase is backed by 15 years of computer experience and over 2.2 million satisfied customers. Call us toll-free to order your WinBook XP today.

WINBOOK XP FEATURES

- SL ENHANCED INTEL 486 DX4-75MHz
- WEIGHT: 5.9 LBS. DUAL-SCAN COLOR 6.1 LBS. OPTIONAL ACTIVE MATRIX COLOR
- DIMENSIONS: 11.3" X 8.5" X 1.7"
- 4 OR 8MB RAM (EXPANDS TO 16 OR 32MB)
- 3.5" 1.44MB DISKETTE DRIVE
- REMOVABLE 120 TO 520MB HARD DRIVE
- VGA DUAL SCAN STN COLOR OR OPTIONAL ACTIVE MATRIX DISPLAY
- 10-CELL 2500mA NiMH BATTERY & AC PACK
- SUSPEND/RESUME FEATURE
- TWO TYPE II OR ONE TYPE III PCMCIA SLOT
- INTEGRATED TRACKPOINT II-LIKE POINTING DEVICE OR OPTIONAL DUAL-BUTTON 19mm TRACKBALL
- PARALLEL, SERIAL & PS/2® PORTS
- 1MB VIDEO MEMORY WITH EXTERNAL VGA PORT
- LCD FUNCTION INDICATOR PANEL
- 14.4 INTERNAL SEND/RECEIVE FAX/VOICE/DATA MODEM OPTIONAL
- INTERNAL AUDIO OPTIONAL
- DOCKING STATION OPTIONAL

$1999
- Intel 486 DX4-75MHz
- Dual Scan Color
- 4MB RAM
- 120MB Hard Drive

$2999
- Intel DX4-75MHz
- Dual Scan Color
- DOS & Windows
- 8MB RAM
- 520MB HDD
- 14.4 Fax Modem

OTHER MODELS AVAILABLE

CALL NOW TOLL-FREE

1-800-468-7503

Monday-Friday, 8am-9pm EST • Saturday, 9am-4pm

1160 Steelwood Rd. Columbus, OH 43212 • FAX: 1-800-448-0308

WESTERN DIGITAL ROCKETCHIP™ VIDEO GRAPHICS ACCELERATION

intel inside

EASY PAYMENT OPTIONS

MasterCard, Visa, Discover Card, Micro Center® charge, personal check or P.O. with credit approval.

30-DAY UNCONDITIONAL MONEY BACK GUARANTEE

Your satisfaction is unconditionally guaranteed for 30 days from date of purchase. If for any reason you are not satisfied with your purchase from us, we will be glad to give you your money back.

©1994 WinBook Computer Corporation. All rights reserved. WinBook and Micro Center are registered trademarks of Micro Electronics, Inc. The Intel Inside logo is a registered trademark of the Intel Corporation. TrackPoint is a trademark and ThinkPad is a registered trademark of International Business Machines Corporation. All other trademarks and registered trademarks are property of their respective corporations.

Circle 197 on reader service card

THE TOP 20

PC WORLD BUDGET DESKTOPS

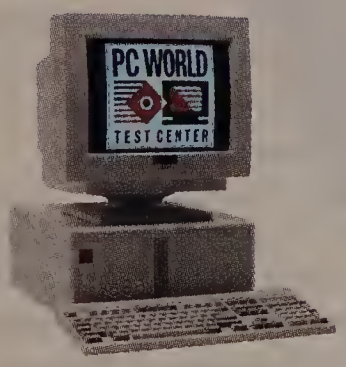
1 Diamond DT 486-66
Super-snappy DX2-66 costs just $1699.

➤ New this month ◀ No change from last month
▲ Up from last month ▼ Down from last month

BEST BUYS		Last month	Months on list	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)	Bus slots
1	➤	Diamond DT 486-66	–	1	91	64	69/69	$1699	486DX2-66	8	270	ISA, VLB
2	▼	CompuAdd C466D	1	5	88	56	78/75	$2195	486DX2-66	8	425	ISA, VLB
3	◀	Polywell Poly 486-40DX	3	4	88	51	69/71	$1600	AMD 486DX-40	8	270	ISA, VLB
4	▼	Gateway P4D-66 Best Buy	2	4	88	60	73/77	$2299	486DX2-66	8	540	ISA, PCI
5	▲	Austin Power System 60	6	2	88	64	70/80	$2258	Pentium-60	8	420	ISA, PCI
6	▼	ATronics PCI Emerald	4	3	86	59	69/69	$1995	486DX2-66	8	256	ISA, PCI
7	▼	Dell OptiPlex 450s/L	5	2	86	52	76/85	$1957	486SX2-50	4	270	ISA
8	▼	Everex Step VL EISA DX2/66	7	5	85	58	83/68	$2249	486DX2-66	8	240	EISA, VLB
9	▲	Austin Premier 486 System	8	4	84	50	70/80	$1984	486DX2-66	8	340	ISA, VLB
10	▼	NMC Pro-System 4100	9	2	84	70	69/70	$2409	DX4-100	8	420	ISA, VLB
11	▲	Acma 486DX2-66 PCMCIA System	14	5	84	54	72/81	$1995	486DX2-66	8	340	ISA, VLB
12	➤	Ambra D466I/VL	–	1	83	68	66/70	$2460	486DX2-66	16	540	ISA, VLB
13	▼	Axik 486DX2-66PCI	11	7	83	57	69/70	$2198	486DX2-66	8	340	ISA, PCI
14	▼	MidWest Micro 486DX2-66	12	3	83	51	69/68	$1899	AMD 486DX2-66	8	340	ISA, VLB
15	▼	Dell OptiPlex 4100/L	13	4	83	71	76/85	$2499	DX4-100	8	170	ISA
16	◀	Quantex Q486DX2/66MM-4	16	4	83	55	69/69	$2259	486DX2-66	8	540	ISA, VLB
17	◀	AST Bravo MT 466d	17	8	82	53	79/79	$2128	486DX2-66	8	170	ISA
18	▼	DTK Feat-38	15	2	82	44	78/79	$1900	486DX2-66	4	210	ISA, VLB
19	▼	MicroSource Tempest Premier/PCI	10	3	82	65	69/70	$2375	Pentium-60	8	340	ISA, PCI
20	▼	MIS M466T	18	8	82	59	69/68	$1999	486DX2-66	8	240	ISA, VLB

[1] Call 900/903-2972 and use the fax reprint numbers to order fax copies of system reviews. You may order an instant fax of up to 3 individual systems' capsule reviews or 1 capsule plus features table and test reports ($4.95); a complete month's review ($9.95 each; January 3001, February 3002, March 3003, April 3004, May 3005, June 3006, July 3007, August

2 **CompuAdd C466D**
$2195, DX2-66, 425MB drive.



3 **Polywell Poly 486-40DX**
DX2-66 speed for $1600.

4 **Gateway P4D-66 Best Buy**
Nimble DX2-66, 540MB drive.

5 **Austin Power System 60**
Low-cost $2258 Pentium-60.

Monitor size/ dot pitch	Vendor contact number	Issue reviewed	Fax reprint number [1]	Comments
14"/.28	800/989-7253	current	3138	Very fast DX2-66 at an amazingly low price grabs top Budget spot.
15"/.28	800/627-1961	May	3103	Well-rounded DX2-66 with good service and reliability.
14"/.28	800/999-1278	June	3104	Lowest-cost Best Buy gets surprisingly good performance from AMD DX-40.
15"/.28	800/846-2000	June	3098	Generous hard drive for this price point plus PCI bus make this a good choice for heavy-duty work.
15"/.28	800/752-1577	Mar	3062	Best Buy Pentium ties for fifth-fastest on Budget Top 20; cheaper than some DX2-66s.
14"/.28	800/488-7776	July	3120	Low-cost, solid-performing PCI-based 486DX2-66.
14"/.28	800/289-3355	Aug	3130	One of the first SX2-50s is surprisingly fast; would do even better with 8MB of RAM.
15"/.28	800/821-0806	Dec	3105	Price drop keeps EISA system high on budget chart.
14"/.28	800/752-1577	June	3109	Low-priced DX2-66 workstation.
15"/.28	800/424-2983	Aug	3129	Second-fastest budget system.
15"/.28	800/786-6888	May	3106	Price cut moves this system with PCMCIA slot up chart.
15"/.28	800/252-6272	current	3139	Very fast DX2-66 is faster than some Pentiums, has big hard drive for price.
14"/.28	800/234-2945 [2]	Mar	3063	Good all-around DX2-66 with PCI bus.
15"/.28	800/728-8582	July	3121	Solid AMD DX2-66 is sound value.
14"/.28	800/289-3355	June	3111	Fastest budget system hurt mainly by poor expandability and small hard drive.
15"/.28	800/288-0566	June	3107	Good-value multimedia system with very large hard drive for the money.
15"/.28	800/876-4278	Feb	3110	Decent DX2-66 hurt by small hard drive; on list eight months.
14"/.28	818/810-0098	Aug	3131	Slow, inexpensive DX2-66 would perform somewhat better with more RAM.
14"/.28	800/848-5161	July	3122	No-frills Pentium system at great price.
14"/.28	800/733-9188	Dec	3052	Bare-bones DX2-66 offers rock-solid performance.

3008, September 3009); and a list of all systems tested by the PC World Test Center for the Top 20s ($4.95). Touch-tone phone required. Charges will appear on your telephone bill.

[2] In California call 408/735-1234.

CompuAdd support won't raise eyebrows either in delight or in dismay. Policies are standard fare, with tech support available 15 hours daily except on weekends. Feedback to our Reliability and Support Monitor has been good. Overall, the CP60p is a very capable system and lands firmly on our Power Desktops list. *CompuAdd, 800/627-1961, 512/250-1489* **Reader service no. 727**

DECpc XL590

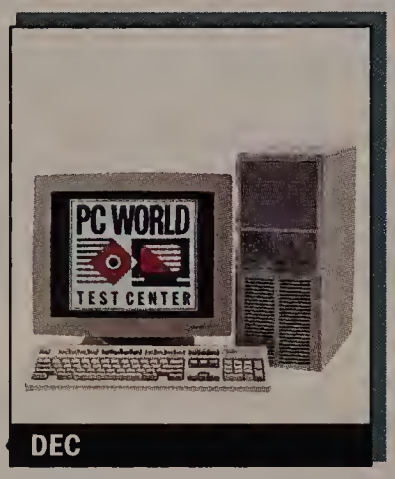
PC WORLD TOP 20 8 POWER DESKTOP

PROS: Wonderful performance, 17-inch monitor, very expandable, accepts a second CPU

CONS: Pricey

Here's one for the power hungry who have the budget to support their computing ambitions. DEC's new Pentium-90 rampaged through our test suite, finishing close behind the fastest PC we've ever tested. At $5089, however, it's the most expensive system on our Power Desktops Top 20.

You get a four-star lineup of components with this tower: 16MB of RAM, 256K of secondary cache, a 540MB SCSI hard drive, and a 2MB 64-bit PCI Diamond Stealth graphics card. Add in the 17-inch monitor, and great video is yours—up to 1280 by 1024 resolution. Unlike many high-end power systems, however, this DEC has no CD ROM drive.



DEC

But there's plenty of room to add new devices: You'll find three free drive bays, plus slots for five full-length cards, including two free PCI slots. Should you move to more powerful and resource-demanding operating systems—such as Windows NT or even UNIX—the XL590 is ready. Instead of putting the processor on the motherboard, DEC places it on a removable card along with an extra CPU socket. With this design you can plug in a board carrying a faster processor, when one is released, or you can plug in a second processor next to the original to create a multiprocessor unit. The system is sturdy, and the motherboard is uncluttered; everything important lies within easy reach.

DEC service and support is excellent, with an outstanding three-year warranty and technical support available 24 hours a day, seven days a week. The company also shines in our reliability and service survey. Respondents report a low rate of problems, and a very high proportion of buyers say they are satisfied with the help they received. If the high price doesn't daunt you, this super-fast and amply configured powerhouse gives you a degree of flexibility and upgradability rare in today's market. *Digital Equipment Corp., 800/722-9332, 508/493-5111* **Reader service no. 728**

Diamond DT 486-66

PC WORLD TOP 20 1 BUDGET DESKTOP

PROS: Great price, solid performance, good expandability

CONS: Short tech support hours

What's the secret to capturing a budget desktop number one Best Buy? For Diamond, the answer is easy: Offer a system that's solid in all respects at an irresistible price. The DT 486-66 has no fancy components, but for a rock-bottom $1699, you get great performance for a DX2-66 and plenty of expandability.

The DT 486-66 has basic features: 8MB of RAM and 256K of secondary cache, a 270MB hard drive, and a 14-inch monitor with a 1MB VL bus video adapter. The exception to this run-of-the-mill lineup is the 1MB VL bus caching hard disk controller. But while the system's components aren't that exciting, its performance is terrific for a PC of this CPU class. Not only did the DT 486-66 handily beat out most of its DX2-66 desktop peers, it even nudged past a few Pentium-60s.

Diamond

The DT 486-66's low price and modest configuration may tempt you to add devices. Fortunately, this system is expandable; surprisingly so for a compact. Four externally accessible drive bays and four expansion slots are available for adding in peripherals.

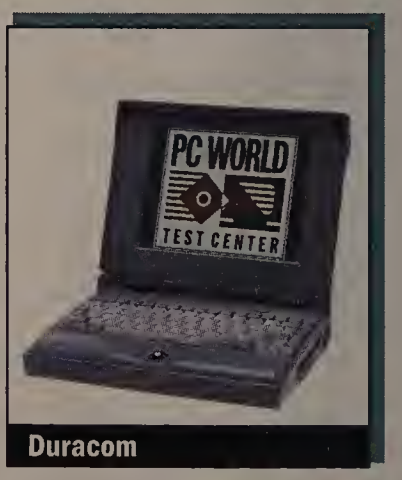
Diamond offers solid service and support policies to boot. The warranty covers parts for 15 months and labor for two years, and you get a year of free on-site service. The one-day turnaround policy on factory repairs is exceptional. The only drawback is the relatively short technical support hours: Diamond's toll-free line is available just 9 hours a day, and only on weekdays. But the outstanding balance of low price and high performance makes the DT 486-66 this month's best bargain in a budget desktop. *Diamond Technologies, 800/989-7253, 714/533-9910* **Reader service no. 729**

Duracom TravelPro5110

PROS: Excellent performance, removable hard disk, built-in audio

CONS: Short battery life, heavy

The TravelPro5110 sports the DX4-100—the speediest CPU ever tucked into a notebook. So how did it fare in our test suite? This sturdy portable lagged behind half its DX4-75 and even many of its DX2-66 competitors, but most power users will still be satisfied with its performance, as well as with most of its other features. The vivid 9.5-inch active-matrix color screen is a joy, the removable 200MB hard drive is more than decent by mobile standards, and we found the keyboard and trackball very comfortable. The TravelPro also has Business Audio.

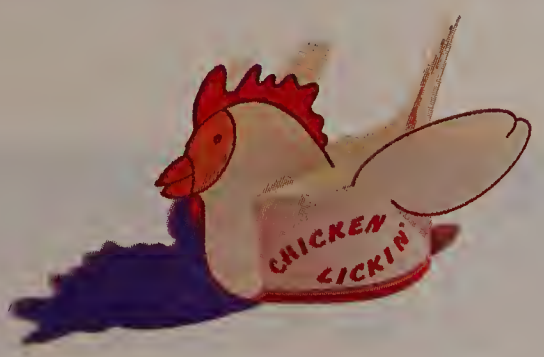


Duracom

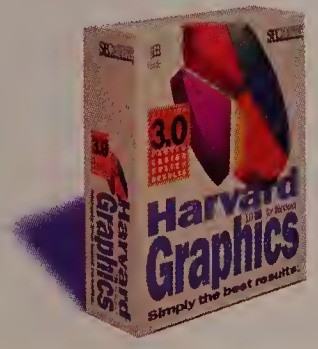
The $4225 price is reasonable for all you get, but there are several drawbacks. At 8.6 pounds, this TravelPro is one of the heaviest notebooks available. Even more inconvenient is its short 2-hour battery life. Finally, Duracom's support package is a bit thin. Most policies are typical, and techs took our calls in less than 2 minutes, but customers are starting to expect more than the 11-hour-per-day, weekday-only support this company offers. These considerations kept the TravelPro 5110 off our Power Mobile list. *Duracom Computer Systems, 800/551-9000, 214/518-1200* **Reader service no. 730**

Your roommate helped you with your term paper.

Uncle Seymour got you your first job.



Why not get some real advice on your next presentation?



Introducing Harvard Graphics 3.0.

Want some advice from an expert to make your presentations more effective? There's one inside every box of new Harvard Graphics 3.0. With this new version, Harvard Graphics takes its most popular feature—the Advisor—and carries it forward a quantum leap. The new Advisor System puts thousands of hours of presentation savvy to work for you, automatically. Suddenly, the guesswork and gruntwork of putting together a presentation are ancient history. You get Design Tips to help you choose the right colors and layouts. Quick Advice to tell you what kind of chart will best dramatize your data. And the Design Checker to review and improve on your whole presentation, just like a spellchecker. Want to make it really easy on yourself? Just use one of the enclosed Quick Presentations—a collection of polished presentations you can instantly customize for your own use. But all this is just scratching the surface. New Harvard Graphics 3.0 contains all kinds of new features. And it works with all your other Windows applications. Upgrading is a no-brainer. So, go ahead, just pick up the phone.

Upgrade For Only $99.*
Want more information? Call 1-800-336-8360, x377.

SPC SOFTWARE PUBLISHING CORPORATION®

* Upgrade eligibility requires that you own a licensed copy of Harvard Graphics or competitive presentation software. Other conditions apply; call for details. Harvard Graphics and the Software Publishing Corporation logo are registered trademarks of Software Publishing Corporation. Harvard Graphics is a product of Software Publishing Corporation and has no connection with Harvard University. SPC acknowledges all trademarks and the rights of trademarks referred herein. © 1994 Software Publishing Corporation. All rights reserved.

THE TOP 20

PC WORLD

MOBILE PCs

1 AT&T Globalyst 200 (486DX2-50)
Great screen, fine performance.

➤ New this month ◀ No change from last month
▲ Up from last month ▼ Down from last month

POWER SYSTEMS

		Last month	Months on list	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1	➤ AT&T Globalyst 200 (486DX2-50)	–	1	97	41	74/81	$4105	486DX2-50	8	250
2	◀ Ambra N75D-340	2	2	95	40	62/69	$3199	DX4-75	8	340
3	▼ Gateway ColorBook DX4-75	1	2	95	41	62/85	$3495	DX4-75	8	250
4	▼ Acer AcerNote 780cx	3	2	94	40	68/81	$3979	DX4-75	8	340
5	▲ Aquiline Hurricane	6	2	93	45	62/66	$5400	486DX2-66	8	540
6	▼ NEC Versa 75EC	4	3	92	42	62/74	$5000	DX4-75	8	340
7	▼ Gateway ColorBook DX2-50	5	3	91	33	62/85	$2995	486DX2-50	8	260
8	▼ Toshiba T4700CT 486 Notebook	7	6	91	35	80/78	$4549	486DX2-50	8	203
9	▼ TI TravelMate 4000E WinDX4/75	8	4	91	38	69/79	$4999	DX4-75	4	455
10	▲ IBM ThinkPad 750C	12	6	91	33	75/83	$5499	486SL-33	12	170

BUDGET SYSTEMS

		Last month	Months on list	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1	➤ IBM ThinkPad 500	–	1	98	26	75/83	$1798	IBM486SLC2-50	4	170
2	▼ IBM ThinkPad 355	1	2	97	29	75/83	$2099	486SX-33	4	170
3	▼ Compaq Contura Aero 4/33C Model 170	2	3	94	28	83/89	$2425	486SX-33	8	171
4	▼ Toshiba Portégé T3400	3	4	91	29	80/78	$2188	486SX-33	8	120
5	▼ Compaq Concerto 4/33 Model 250	4	6	90	24	83/89	$2428	486SL-33	4	250
6	➤ Gateway ColorBook DX2-40	–	1	89	27	62/85	$2699	486DX2-40	8	250
7	➤ AT&T Globalyst 200 (486SX-33)	–	1	87	23	74/81	$2700	486SX-33	4	170
8	▼ Gateway Handbook DX2-40	5	2	87	27	62/85	$2499	486DX2-40	8	130
9	▼ ZDS Z-Lite 486-25	6	6	86	17	67/80	$1599	486SL-25	4	170
10	▼ TI TravelMate 4000E WinSX/25 Color	7	4	85	19	69/79	$1800	486SX-25	4	129

Best Buy

[1] CA = color active, CD = color dual-scan, CP = color passive, MP = mono passive.

[2] Call 900/903-2972 and use the fax reprint numbers to order fax copies of system reviews. You may order an instant fax of up to 3 individual systems' capsule reviews or 1 capsule plus features table and test reports ($4.95); a complete month's

2 Ambra N47D-340
Quick business color notebook.

1 IBM ThinkPad 500
$1798 for peppy mono subnote.

2 IBM ThinkPad 355
Fast mono note, great battery life, $2099.

Weight (pounds)	Battery life (hours)	Screen type/size[1]	Vendor contact number	Issue reviewed	Fax reprint number[2]	Comments
7.4	3:33	CA/9.5"	800/637-2600	current	3647	Fast, reliable, powerful, and looks good. An ideal traveling companion.
8	4:46	CD/10.3"	800/252-6272	Aug	3642	Best presenter's notebook with built-in sound, good battery life; the price is right too.
7.2	4:28	CD/10.3"	800/846-2000	Aug	3641	Speedy power notebook with large, quality screen; solid battery life.
8.2	3:20	CA/9.5"	800/848-2237	Aug	3643	Reliable all-around power notebook.
9.2	4:03	CA/9.5"	518/272-0421	Aug	3644	Fastest notebook we've tested; loaded with features like built-in sound, huge hard disk.
8.4	3:20	CA/9.5"	800/632-4636	July	3636	Ultimate in versatility; completely modular design.
7.2	4:29	CD/9.4"	800/846-2000	July	3635	Good balance of performance, battery life, and cost.
8.8	4:02	CA/9.5"	800/334-3445	Apr	3603	One of the ten best power notes six months running.
8	3:02	CA/9.5"	800/527-3500	June	3625	Quality DX4-75 notebook, but pricey.
8.2	3:52	CA/10.5"	800/426-7735	Apr	3601	Wonderful screen and IBM quality, but needs larger hard drive at this price.
6.2	5:40	MP/7.5"	800/426-7735	current	3648	Top-value subnote blends low price with great functionality.
6.6	5:40	MP/9.5"	800/426-7735	Aug	3645	Fastest budget notebook with great battery life.
5	6:18	CP/7.8"	800/345-1518	July	3637	Top-rated budget color subnote has great battery life and performance.
5.8	6:31	MP/8.5"	800/334-3445	June	3627	Fastest mono subnote with amazing battery life.
8.2	6:31	MP/9.5"	800/345-1518	Apr	3602	Flexible pen-based system with fantastically long-lasting battery.
7.2	4:50	CD/9.5"	800/846-2000	July	3638	Price cut makes this dual-scan color unit eligible for Budget list for first time.
7.4	4:11	CP/9.5"	800/637-2600	current	3649	Wonderful design on this color model, but sluggish for the price.
5	5:06	MP/7.8"	800/846-2000	Aug	3646	Price increased on this subnote, but you now get a fax-modem.
6.2	4:16	MP/8.5"	800/553-0331	Apr	3622	Lowest-cost budget subnote is a solid value.
8	4:40	CD/8.2"	800/527-3500	June	3630	Cheapest budget color notebook.

review ($9.95 each; April 3004, May 3005, June 3006, July 3007, August 3008, September 3009); and a list of all systems tested by the PC World Test Center for the Top 20s ($4.95). Touch-tone phone required. Charges will appear on your telephone bill.

Empac Magnum

PROS: Fast for a Pentium-60, 17-inch monitor

CONS: Skimpy support policies

The Empac Magnum comes with a formidable array of components. This Pentium-60 PC's 16MB of RAM, 540MB hard drive, 2MB VL bus caching hard disk controller, and 2MB Diamond Viper VLB bus video card helped it sail past the average Pentium-60. The video card is an excellent match for the 17-inch monitor, which together provide a comfortable viewing environment for most users even up to 1280 by 1024 resolution. And Empac's system is very upgradable. You get a whopping six free drive bays and five free expansion slots, including a VL bus slot. The tower is attractively priced at $3500.

Empac

The one place Empac needs shoring up is in service and support. A one-day turnaround policy for factory repairs stands out; otherwise policies are basic or subpar. There's no money-back guarantee, and tech support is available only 9 hours a day, weekdays only, and is not toll-free. Empac's candidate is a lot of machine for the money. If the Magnum were backed by stronger policies, it would be even more attractive. *Empac Int'l, 510/226-4732* **Reader service no. 731**

IBM ThinkPad 500

PC WORLD TOP 20 — 1 BUDGET MOBILE PC

PROS: Light, low cost, excellent battery life, top-notch service and support

CONS: Small monochrome display

The ThinkPad 500 costs $1798, weighs 6.2 pounds ready to travel, and stands less than 2 inches tall. But despite its small size and price, it produced surprisingly big performance. Based on Big Blue's own 486SLC2-50 processor, this subnotebook turned in nearly the performance of a typical SX-33 mobile PC, and that's with only 4MB of RAM. The system did exceptionally well in the WordPerfect test, beating out many DX2-50 mobile units, although it fared poorly in both of the Paradox tests. Adding another 4MB of RAM (for an extra $265) would improve overall performance noticeably. We got a marathon 5 hours and 40 minutes out of the NiMH battery.

IBM

The ThinkPad 500 is an inch narrower than a typical notebook, but the solid tactile response of the keys plus an ingenious fingertip-controlled pointing device make it surprisingly comfortable to use for hours at a time. Also, its 170MB hard drive is the largest we've seen on subnotes. While the 7.5-inch monochrome screen may be too small for extended work sessions, you can always plug in an external monitor. The ThinkPad 500 supports resolutions on an external display up to 800 by 600. Like nearly all subnotebooks, the ThinkPad 500 lacks an internal floppy drive, but it comes standard with an external floppy drive, and it has a PCMCIA Type II slot. System RAM upgrades use a separate proprietary slot.

Respondents to our reliability and service fax-back survey rank IBM near the top for product reliability and customer satisfaction. Policies are excellent, too, including a generous three-year warranty and toll-free tech support available round the clock, weekends included. On-site service is available for $40.

If you're looking for an ultraportable budget mobile PC, put this one at the head of your list. Even with the small monochrome display, the ThinkPad 500's small size, low cost, wonderful battery life, and terrific support earn it the top spot on our Budget Mobile PCs chart. *IBM, 800/426-7735*

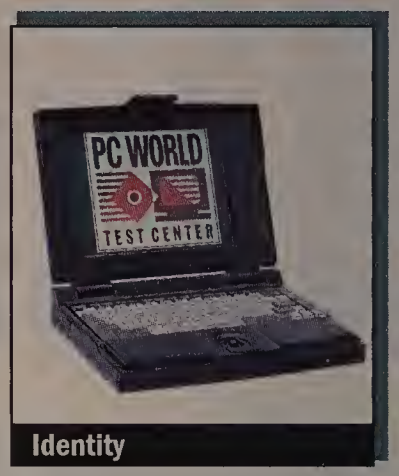
Identity Systems Select Series

PROS: Low price, long battery life with second pack

CONS: Screen adjusters hard to use

Most high-tech nomads won't know this company, but it offers a notebook you can warm up to quickly. The Select is a competent, good-looking traveling companion that's comfortable to work with, and the price is a reasonable $2458.

The machine has solid performance for its class. It zipped through the WordPerfect portion of our tests faster than a typical 486DX2-50 mobile PC. Not bad for a 486DX-33 notebook with just 4MB of RAM. Most users will appreciate the centrally located trackball and comfortable keyboard, and the 200MB hard drive will suffice for the typical Windows traveler. Buy a second battery pack, and you can swap it in for the floppy drive and double battery time. We got 3.25 hours from a single battery in our test. The biggest compromise with the Select Series is the 9.5-inch passive color display. It's certainly big enough, but fine-tuning the contrast and brightness is difficult with the keyboard-based adjusters, a drawback in variable-lighting conditions.



Identity

Support policies are basic; Identity Systems offers a one-year warranty and toll-free technical support 11 hours a day, weekdays only. Overall, we found the Select a well-rounded notebook and a good performer for the money—so good, in fact, that it almost made our Top 20 Mobile PCs list. *Identity Systems Technology, 800/888-3475, 214/446-6363* **Reader service no. 732**

Insight PCI P66 SCSI

PC WORLD TOP 20 — 19 POWER DESKTOP

PROS: Speedy, reasonably priced, very upgradable

CONS: None

Looking for a computer with fearsome speed, a friendly price, and most of the frills? Take a look at Insight's newest tower. This company's PCI P66 SCSI is one of the fastest office computers you can find for $3678, earning this system a spot on our Power Desktops Top 20 chart. **continued on page 157**

everything IS NEW.
nothing IS THE WAY it WAS.
it's the wake-UP CALL for a NEW way of WORKING.
TIME TO rise and shine.

INTRODUCING 1-2-3 RELEASE 5. NOW THE LEGENDARY SPREADSHEET BRINGS MORE PEOPLE TO THE NUMBERS AND THE NUMBERS TO LIFE.

1-2-3® has always helped individuals become more productive. Now it goes to a new realm—workgroup productivity. With strengthened ties to Lotus Notes® and new, sophisticated routing features, workgroups are using 1-2-3 Release 5 to make decisions, reach consensus and explore possibilities.

No other spreadsheet has the features of 1-2-3 Release 5. Features that make everyday spreadsheet tasks easier. Features that help you move from task to task fluidly. Maximum productivity, minimum effort.

TAP THE POWER OF NOTES WHEN YOU'RE IN 1-2-3. TAP THE POWER OF 1-2-3 WHEN YOU'RE IN NOTES.

Say you're working on the annual budget in 1-2-3. You can save your spreadsheet in Notes. Then share ideas and information with colleagues working on the same budget at the same time.

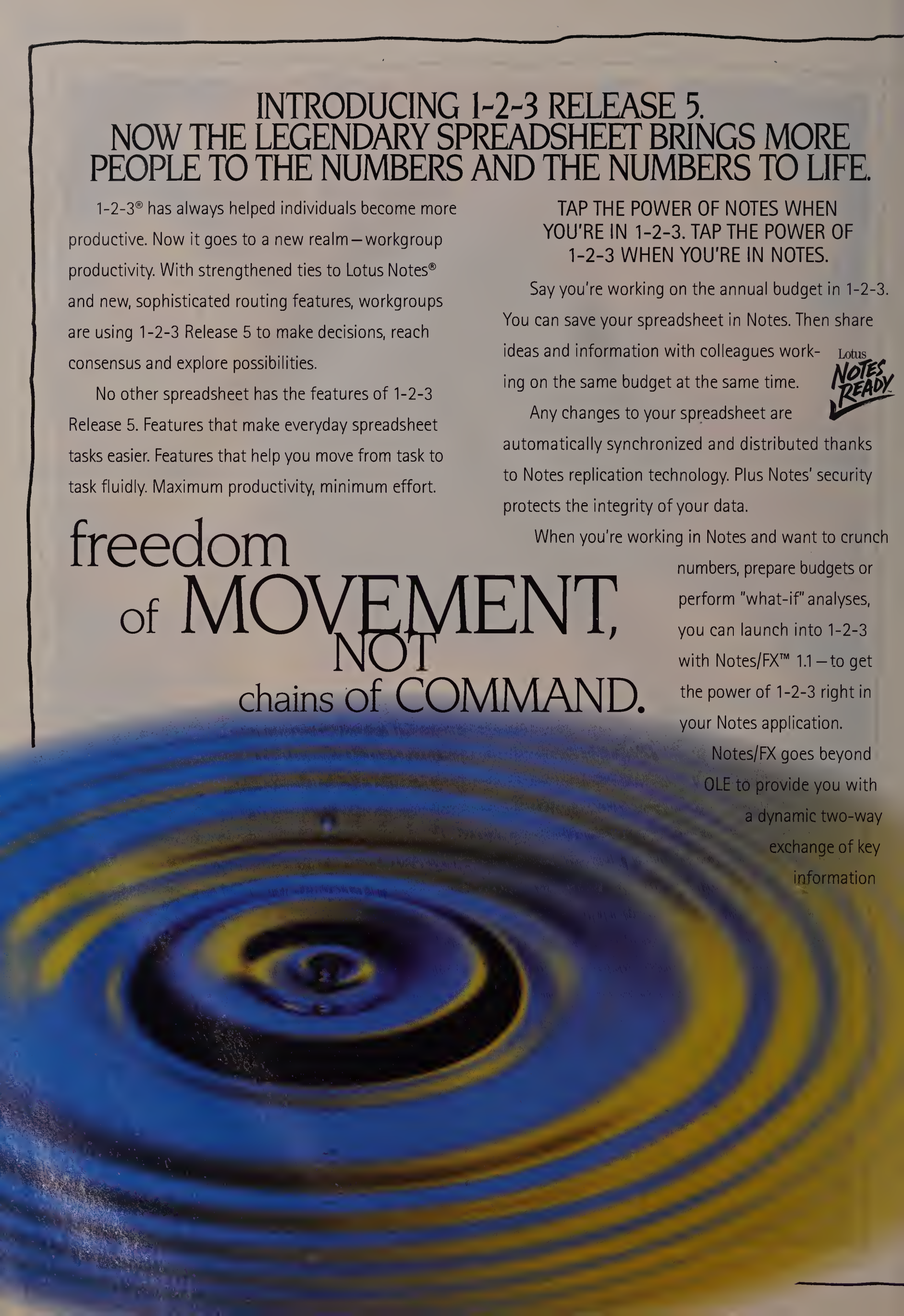
Lotus NOTES READY

Any changes to your spreadsheet are automatically synchronized and distributed thanks to Notes replication technology. Plus Notes' security protects the integrity of your data.

When you're working in Notes and want to crunch numbers, prepare budgets or perform "what-if" analyses, you can launch into 1-2-3 with Notes/FX™ 1.1—to get the power of 1-2-3 right in your Notes application.

Notes/FX goes beyond OLE to provide you with a dynamic two-way exchange of key information

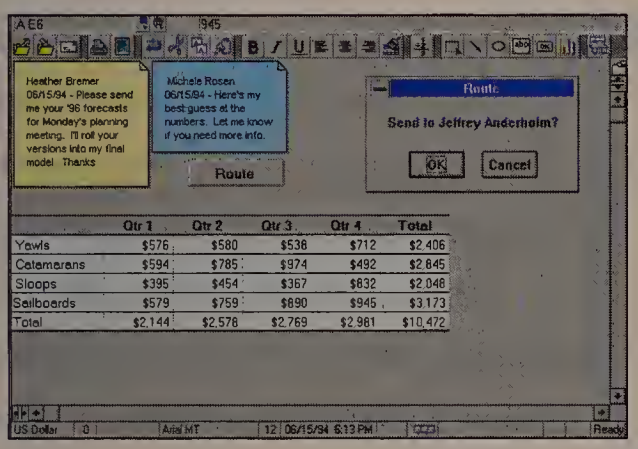
freedom of MOVEMENT, NOT chains of COMMAND.



between Notes and 1-2-3. So you can roll that 1-2-3 information back into any Notes application.

POWERFUL WORKGROUP FEATURES EVEN WITHOUT NOTES.

1-2-3's powerful Version Manager™ lets each person in your workgroup save multiple sets of charts to any name range. So you know the who, what, when and why of every change all the time.



1-2-3's Range Routing lets you share data with colleagues—sequentially or all at once—collecting their comments and input into a single document.

Plus, unlike other spreadsheets, 1-2-3 can designate particular ranges for comment or review by particular users, rather than routing the entire worksheet. Range Routing lets you mail the spreadsheet range to work-group members for input, track progress, then roll every-one's ideas back into your file, complete with comments and changes tracked as versions.

1-2-3 Release 5 worksheets and ranges can be routed using either VIM or MAPI based e-mail and can be routed either serially or in parallel.

MAXIMUM PRODUCTIVITY, MINIMUM EFFORT.

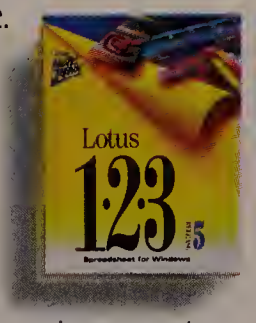
1-2-3 Release 5 is packed with innovative new features designed to help you get more done with less effort.

SmartMasters™ are predesigned and customizable templates of everyday business forms—like expense reports, invoices and purchase orders—with built-in intelligence to guide you through common tasks in record time. Or create custom SmartMasters for yourself or your workgroup.

With Lotus Maps you can create instant maps of geographic data. Select a range of data and watch 1-2-3 Release 5 create the appropriate map with color-coding based on data ranges. 1-2-3 Release 5 ships with maps for the world by country, U.S. by state, Canada by province, Europe, Mexico, Japan, Taiwan and Australia.

1-2-3 Release 5 features seamless integration with Lotus Approach® database to easily create data entry forms and generate reports and mailing labels.

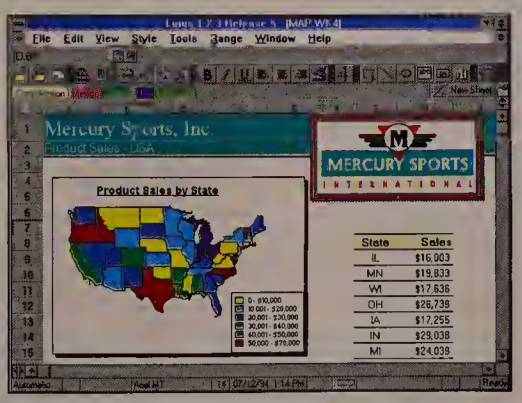
With Fast Format you can apply the formatting you've designed for one range to any other range in the worksheet—with one click of the mouse.



One-Step Charting lets you build a chart complete with labels, titles and legends, all in a single step.

Drag-and-Fill fills in ranges from other documents in just one step. And our improved OLE 2.0 Drag-and-Drop lets you move copy or data across worksheets or files fast.

Multi-page Print Preview lets you view up to nine spreadsheets on your screen before you print.



1-2-3 Release 5 features Lotus Maps. It's the easiest, most effective way to analyze your spreadsheet data geographically.

Taken all together, the new 1-2-3 is loaded with enhancements that make getting the job done a whole lot easier—alone or in a workgroup. And 1-2-3 Release 5 gives you the best compatibility with 1-2-3 for DOS of any spreadsheet. To learn more about 1-2-3 Release 5, visit your Lotus Authorized Reseller or call **1-800-TRADE-UP, ext. 9971*** for a free demo disk. A 1-2-3 upgrade costs $119.**

Lotus
Working Together®

NEW SMARTSUITE 3.0. A MAJOR RELEASE TO HELP YOU AND YOUR TEAM WORK TOGETHER.

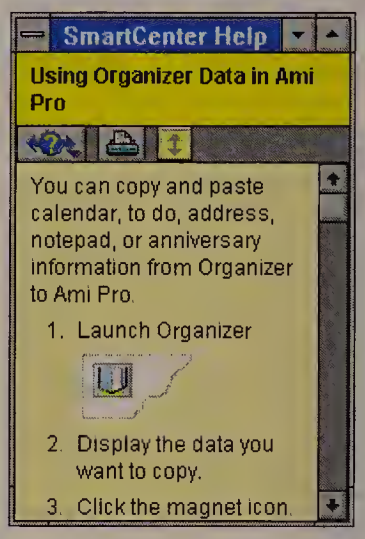
To work better people need powerful desktop applications, built for both individual and team productivity. SmartSuite® 3.0 is exactly that. It's the best suite for this new way of working because it's the only suite built to optimize Lotus Notes.

The applications that make up SmartSuite have been upgraded in some very important ways—so they work harder and work together better than ever.

1-2-3 Release 5 is packed with new features like SmartMasters spreadsheets templates, Lotus Maps for geographic visuals of data, Smart Assistants to guide you, seamless integration with Approach database, Range Routing for mailing spreadsheet ranges, OLE 2.0 Drag and Drop, and, of course, Lotus Notes Integration.

The new Lotus Approach 3.0 offers unprecedented ease-of-use, PowerClick™ reporting, X10™ technology (our new, exclusive, speed-optimized architecture) and the easiest-to-design forms, mailing labels and cross-tabs on the market.

Ami Pro® 3.1 offers powerfully fast word processing (49% faster than Word, 103% faster than WordPerfect®†), low memory/hard disk requirements (4MB RAM, 15MB for complete installation), with proofing tools, collapsible click and drag outlining, revision marking, powerful macro language and automatic list renumbering. There are over 55 predesigned style sheets for memos, faxes, reports and more. Built-in charting & in-context drawing tools. Ami Pro also seamlessly imports documents from other word processors.



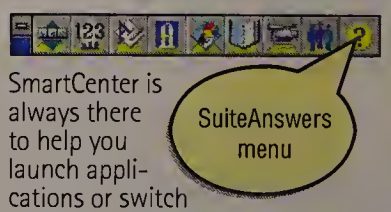
Help Card, one of SmartSuite's powerful help tools, guides you through cross-application tasks.

Freelance Graphics® 2.1 features task and industry specific SmartMasters, a unique 3-step process to create presentations, charting and drawing, presentation management and improved import/export capabilities.

And Organizer™ 1.1 offers easy linking for cross-referencing, flexible printing, group scheduling and nifty integration with Ami Pro so you can create monthly calendars in Ami Pro from Organizer appointments.

SMARTSUITE 3.0 IS A BETTER INTEGRATED SUITE ACROSS THE BOARD.

The integration in SmartSuite begins with a consistent look and feel across applications—they share a common user interface, menus, SmartIcons® and a Live Status Bar.



SmartCenter is always there to help you launch applications or switch between them. And Bubble Help is right there for you-all you do is point.

SmartCenter, the headquarters for cross-application services, is always there to help you switch or launch applications. You can customize its icon palette into the configuration that's most convenient for you.

SuiteAnswers are cross-application help tools which include a SmartSuite Guided Tour and task-oriented Help Cards—plus the new ScreenCam™ for creating audio/visual "screen movies." It's the only help service in Windows™ that stays up as you move between applications.

Smart Assistants are your step-by-step guide through common tasks.

And our powerful 1-2-3/Approach database integration lets you analyze and format 1-2-3 data, taking full advantage of Approach's easy-to-use

forms and reports, dynamic crosstabs to pivot rows and columns and tools for creating summaries or viewing data in several formats.

Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. 9988*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus NOTES READY™

the COMMITTEE IS dead. long live the TEAM.

SMARTSUITE, THE NOTESREADY SUITE, EXTENDS THE DESKTOP TO THE WORKGROUP.

SmartSuite 3.0 includes powerful workgroup enhancements. But for an even higher level of workgroup capability, just add Lotus Notes and see what happens:

Combined with Lotus Notes, 1-2-3 Release 5 becomes a model management system that lets team members search a library of worksheets.

Add Notes to Ami Pro 3.1 and it becomes a real "workgroup processor." Use the built-in Notes database for efficient, secure document sharing and tracking. And you can format your Notes or cc:Mail® messages directly in Ami Pro.

Approach 3.0, the top-rated Windows database, becomes a shared reporting, forms and analysis tool. Its advanced integration with Lotus Notes lets you build sophisticated, information-intensive workgroup applications and join Notes data to other types of databases, from dBASE to SQL.

And Freelance Graphics 2.1, used with Notes, becomes a presentation storage system, a library of past presentations, which a team can browse and pull from to create new ones.

For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your

Lotus®
Working Together®

SMARTSUITE 3.0

SmartCenter
(to move between applications)

SmartMasters
(for predesigned templates)

Fast Format
(apply styles throughout documents)

ScreenCam
(to put your ideas in motion)

Smart Assistants
(to guide you)

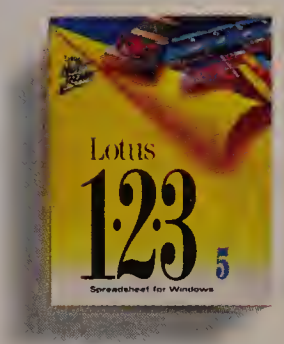
Configurable Single Install
(for easy one-step installation)

Small Footprint On Your PC
(the most efficient suite available)

1-2-3/Approach Integration
(database power in your spreadsheet)

Lotus NOTES READY™

1-2-3 RELEASE 5



SmartMasters
(useful predesigned templates)

Lotus Maps
(geographic visuals of data)

Lotus Approach Integration
(for extra database power)

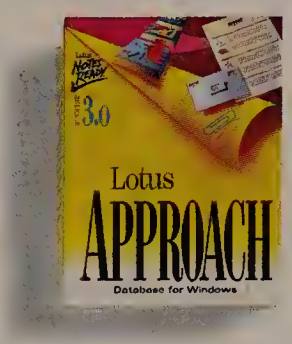
Smart Assistants
(to guide you)

Range Routing
(for mailing spreadsheet ranges)

Direct Access To Database Files
(open dBASE and Paradox® files directly into 1-2-3)

OLE 2.0 Drag-And-Drop
(move or copy data, with visual mouse cues)

APPROACH 3.0



PowerClick Reportwriter
(for wysiwyg design)

Smart Assistants
(to guide you)

InfoBox
(instant on-screen manipulation)

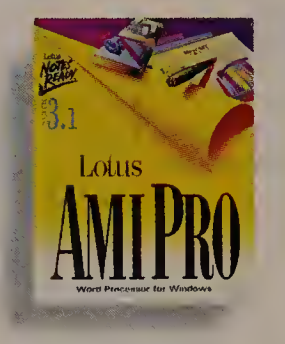
X10 Speed Architecture
(for blazing speed)

Lotus 1-2-3 Integration
(for working with 1-2-3)

PowerKey™ Technology
(for direct access to existing data)

Dynamic Crosstabs
(for drag-and-drop analysis)

AMI PRO 3.1



New Proofing Tools
(for easy document proofing)

Collapsible Click-And-Drag Outlining
(simplifies organization)

Revision Marking
(edit documents without confusion)

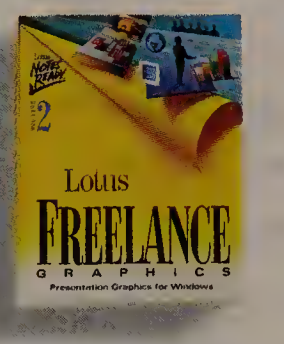
New Style Sheets
(more professionally designed templates than ever)

Text Styling
(make your e-mail look better)

WordPerfect Switchkit®
(the move from DOS is painless)

Stick-It Notes
(add comments and messages)

FREELANCE GRAPHICS 2.1



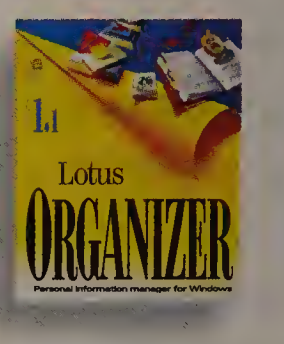
Unique Three-Step Process
(for quick and easy presentations)

One-Click Charting
(access a library of charts and drawings with one click)

Page Sorter
(presentation management at a glance— review and rearrange with ease)

Import/Export
(more file formats than ever— including Harvard/DOS and PowerPoint® 3.0)

ORGANIZER 1.1



Easy Linking
(makes cross-referencing simple)

Flexible Printing
(for your manual planner, mailing labels from your address book)

Group Scheduling
(use with cc:Mail to set up meetings with anyone on your WAN or LAN)

Real Time Access
(instantly view co-workers' busy and free time)

how the NEW SMARTSUITE 3.0 HELPS workgroups work.

The new SmartSuite 3.0. Featuring major new releases of 1-2-3, Ami Pro, Approach database and Freelance Graphics—plus the popular and powerful personal information manager Organizer—this is the ultimate integration of your most important desktop tools. For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. 9988*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus
Working Together®

*In Canada call 1-800-GO-LOTUS. **$119 suggested retail upgrade price. †NSTL, May 1994. ††$299 promotional price available while supplies last. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus, Lotus Notes, 1-2-3, Approach, Ami Pro, cc:Mail, Freelance Graphics, SmartSuite, SmartIcons and Working Together are registered trademarks and ScreenCam, PowerClick, Notes/FX, Version Manager, SmartMasters, Organizer, PowerKey, X10 and NotesReady are trademarks of Lotus Development Corporation. WordPerfect and Switchkit are registered trademarks of WordPerfect Corporation. PowerPoint is a registered trademark and Windows is a trademark of Microsoft Corporation. Paradox is a registered trademark of Borland International, Inc.

When we saw the configuration—16MB of RAM, 256K of secondary cache, and a 2MB PCI video card—we expected lively performance, but this one's a speed demon. This sturdy PCI tower is one of the fastest Pentium-66s you can find, beating out half the Pentium-90s we've reviewed. It also has all the makings of a power-user multimedia PC, including an enormous 1GB SCSI hard drive for storing disk-ravenous sound and video files, and a 15-inch monitor. All the makings, that is, except for the CD ROM drive and sound card. Fortunately, there's acres of room to add them. You get 11 free drive bays (4 externally accessible) and 5 free expansion slots, including 1 you use for either a 16-bit or a PCI card.

Insight

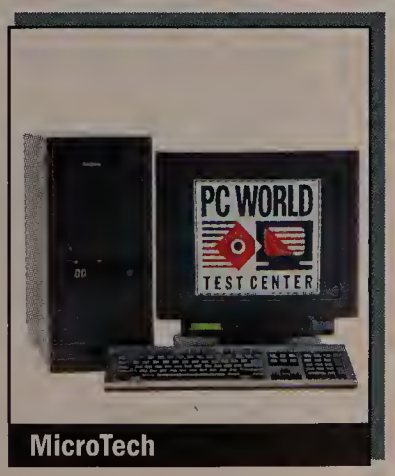
Insight's support policies are typical, with two exceptions. On the upside, you get toll-free tech support 14 hours each weekday, 12 hours on Saturday, and 8 hours on Sunday. On the downside, you have to live in Arizona to get free on-site service for the first year; otherwise, you can't get on-site service at all from Insight. The PCI P66 SCSI's powerful combination of good price, super speed, and generous expandability help it stake a claim to a chunk of Power Desktops Top 20 real estate. *Insight, 800/998-8011, 602/902-1176* **Reader service no. 733**

MicroTech Ultima XVC/100

PROS: Great performance for its class, excellent expandability

CONS: Very expensive for its class

Don't judge MicroTech's Ultima XVC/100 by its processor. This distinctive-looking DX4-100 system, jet black from mouse to monitor case, blew past most of the 60- and 66-MHz Pentium PCs we've tested and even edged by several of the Pentium-90s that we've had on the test bench.



MicroTech

The system's powerful components—including 16MB of RAM and a fast 2MB VL bus graphics accelerator—certainly helped it achieve such speed. The video card, together with a 17-inch monitor, delivers excellent images up to 1280 by 1024 resolution. The 530MB hard drive is spacious. Inside, the Ultima offers plenty of room to expand, with six free drive bays (three of them externally accessible) and six free slots, including a VL bus slot.

Service policies are thin but don't spring any real surprises. Tech support reps are available only 10 hours a day during the week, but you can also reach them 8 hours on Saturdays. MicroTech doesn't offer any on-site service but will mail replacement parts free overnight during the first year. Company policy is to turn repairs around within three days.

The Ultima XVC/100 turned in outstanding performance for a DX4-100 system. Unfortunately, at $4167 it's also pretty pricey for its CPU class. You have your pick of several more-powerful, less-expensive systems that are multimedia ready. *MicroTech Computer, 800/342-6508, 404/345-6508* **Reader service no. 734**

MIS M5P/60

PROS: Inexpensive, multimedia ready

CONS: Hard drive minimal for multimedia work

If you're looking for an inexpensive, reasonably powerful multimedia system, MIS has a desktop for you. Not only is the $2700 M5P/60 one of the cheapest Pentium-60 PCs you can find, it comes nicely decked out with a CD ROM drive, a sound card, a 2MB PCI video card, and a 15-inch monitor.

MIS

Sure, there are a few compromises. If you're heavily into multimedia, you may find the 270MB hard drive cramped. Also, the M5P/60's performance falls a little short of its typical Pentium-60 peers, although, considering that it has only 8MB of RAM rather than the 16MB typical in Pentiums, and that it's dealing with memory-hogging multimedia device drivers, it did reasonably well.

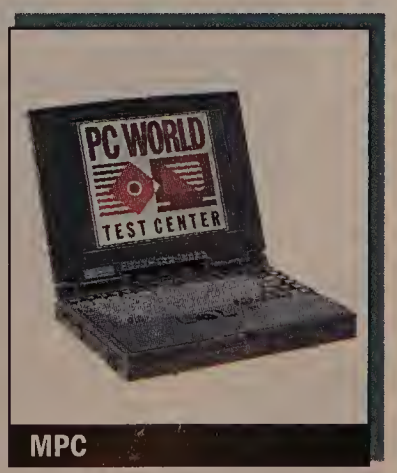
Upgrading the M5P/60 shouldn't be a problem—five expansion slots are available, including one dedicated PCI slot and another that will take either a 16-bit or a PCI card. The only time you might feel pinched is if you want to add drives—only one bay is free. Support policies are adequate, and inexpensive $25-per-year on-site service and a 45-day money-back guarantee are nice pluses. Although this desktop PC is better than many multimedia systems, it's a little too short on speed to make our power Top 20. *MIS Computer, 800/733-9188, 510/226-9188* **Reader service no. 735**

MPC 380

PROS: Inexpensive, fast, large hard drive

CONS: Short battery life, a bit heavy

A 486DX2-66 processor, 8MB of RAM, and a 320MB hard drive—we're talking about a desktop PC, right? Well, with the MPC 380, your desktop can be an airline seat-back tray table or your lap on the commuter train. This traveler has many of the specs of last year's power desktop system in an 8.4-pound case you can pop into your carry-on. Performance is good for a notebook; the system keeps up with a typical DX2-66 mobile PC. Not bad for $2659.



MPC

The 380 is well designed. Its 10.3-inch passive color screen is large and the image quality unusually crisp for the genre, and we found the keyboard and trackball comfortable to use. Aside from its heft, the one major drawback is short battery life—only 2.5 hours in our tests. The system provides a PCMCIA Type III slot, and

FEATURES COMPARISON: THIS MONTH'S CONTENDERS–DESKTOPS

CD ROM Drives Becoming Standard Issue

● Yes
○ No
n/a = not applicable

	Ambra D466l/VL	Ambra D4100l/VL	BEST BUY Austin P5-66	Compaq ProLinea 4/100 Model 525	CompuAdd C4100D	CompuAdd CP60p	DECpc XL590	BEST BUY Diamond DT 486-66
Standard features								
Selling price as of 5/27/94[1]	$2460	$3034	$3298	$3548	$2691	$3407	$5098	$1699
CPU	486DX2-66	DX4-100	Pentium-66	DX4-100	DX4-100	Pentium-60	Pentium-90	486DX2-66
CPU/upgrade socket	238-pin	238-pin	273-pin ZIF	238-pin	238-pin ZIF	273-pin ZIF	320-pin ZIF	238-pin ZIF
BIOS	Phoenix 34381	Phoenix 4.03 4/4/94	AMI 34439	Compaq 03/22/94	Phoenix 0.10	Phoenix 34228	Phoenix 8/28/93	Award 34393
Installed/maximum RAM (MB)	16/64	16/64	16/128	8/100	8/64	8/128	16/128	8/64
30-pin or 72-pin SIMMs	72-pin	72-pin	72-pin	72-pin	72-pin	72-pin	72-pin	72-pin
SIMM sockets/number free	4/3	4/3	4/2	3/2	4/2	4/2	6/2	4/2
Secondary RAM cache installed/ maximum (K)	256/256	256/256	256/256	128/128	128/256	256/256	256/256	256/1024
Case style	compact	minitower	tower	compact	desktop	tower	minitower	compact
Free externally accessible 3½-inch/ 5¼-inch drive bays	0/2	1/1	2/1	0/1	0/1	0/2	0/2	1/3
Free internal 3½-inch/5¼-inch drive bays	1/0	1/0	1/1	0/0	0/0	2/0	1/0	0/0
Free 32-bit EISA/16-bit ISA/8-bit ISA expansion slots	0/4/0	0/6/0	0/4/0[2]	0/3/0	0/2/0	0/4/0[2]	0/4/0[2]	0/4/0
PCI or VL bus slots/number free[3]	1 VLB/1	1 VLB/1	3 PCI/2[4]	0/0	1 VLB/1	3 PCI/2[4]	3 PCI/2[4]	2 VLB/0
Hard disk	WD Caviar 2540	WD Caviar 2540	Seagate ST5660A	Quantum ProDrive LPS	WD Caviar 2340	Conner CFA540A	Seagate ST3610N	Quantum ProDrive LPS
Size (MB)	540	540	520	530	340	540	540	270
Adapter	integrated VLB	integrated VLB	integrated	integrated	integrated	integrated	integrated	1MB Promise DC4030 VL-2
Floppy drives (MB)	1.44	1.44	combo	1.44	1.44	1.44	1.44	1.44
Graphics adapter	integrated VLB	integrated VLB	Diamond Stealth 32	integrated local bus	integrated local bus	Diamond Stealth 32	Diamond Stealth 64	Genoa 8500VL
Installed VRAM/DRAM (MB)	0/2	0/2	0/2	0/1	0/1	0/2	2/0	0/1
Monitor	Ambra BMS-3500	Ambra MPR II	Austin MN2409	Compaq 171FS	CompuAdd TE1464M	CompuAdd TE1564F	DEC VCR 16	CTX 1451
Screen diagonal (inches)/ dot pitch (mm)	15/.28	15/.28	15/.28	17/.28	14/.28	15/.28	17/.26	14/.28
Modem speed for fax/data (kbps)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sound board	○	Media Vision Pro Audio 16	Toptek Micro Golden	○	Diamond	OEM	○	○
CD ROM drive	○	Laser Magnetic Storage CM206	Sony CDU 33A	○	Mitsumi CRMC-FX001D	Mitsumi CRMC-FX001D	○	○
Data transfer rate (K/sec)	n/a	352	300	n/a	300	300	n/a	n/a
Parallel/serial/mouse/SCSI ports	1/2/1/0	1/2/1/0	1/2/0/0	1/2/1/0	1/2/1/0	1/2/0/0	1/2/1/1	1/2/0/0
Service and support								
Warranty (years)	1	1	2	3	1	1	3	1.25/2[5]
30-day money-back guarantee	●	●	●	●[6]	●	●	●	●
On-site service first-year price	$29	$29	free	free	free	free	free	free
Service center turnaround (days)	3	3	2	2	3	3	2	1
Daily toll-free phone support (hours)	24	24	24	24	15	15	24	9
Weekend support	●	●	●	●	○	○	●	○
BBS	○	○	●	●	●	●	●	○
Fax	○	○	●	●	●	●	●	○

[1] All systems priced as configured with DOS 6.0 or later, Windows 3.1, VGA and color monitor, keyboard, and mouse or other pointing device. Selling price is direct or based on vendor estimate.

[2] One less ISA slot available when all PCI slots are filled.

[3] VL slots also accept 16-bit ISA peripherals.

[4] One less PCI slot available when all ISA slots are filled.

[5] Fifteen months parts, two years labor.

[6] Applies to systems bought through Compaq Direct Plus at 800/888-5881. Dealer guarantee may vary.

	Empac Magnum	Insight PCI P66 SCSI	MicroTech Ultima XVC/100	MIS M5P/60	NEC Image 4100es
	$3500	$3678	$4167	$2700	$3813
	Pentium-60	Pentium-66	DX4-100	Pentium-60	DX4-100
	273-pin ZIF	273-pin ZIF	238-pin ZIF	273-pin ZIF	238-pin ZIF
	AMI 34189	Award 1.00.8.AF2	Phoenix 0.10	Phoenix 1.03	Phoenix 4/19/90
	16/128	16/128	16/64	8/128	16/128
	72-pin	72-pin	72-pin	72-pin	72-pin
	4/2	4/2	4/3	4/2	4/0
	256/256	256/256	256/256	256/512	256/256
	tower	tower	tower	desktop	compact
	0/4	0/4	0/3	0/1	0/2
	0/2	7/0	2/1	0/0	0/0
	0/4/0	0/5/0[2]	0/5/0	0/4/0[2]	0/2/0
	3 VLB/1	3 PCI/1[4]	2 VLB/1	3 PCI/2[4]	2 VLB/2
	Conner CFA540A	Micropolis 4110 Drive-SCSI	Seagate ST3655A	Quantum ProDrive LPS	WD Caviar 2540
	540	1080	530	270	540
	2MB Promise DC4030 VL-2	OEM	integrated	integrated	integrated
	1.2, 1.44	1.44	combo	1.44	1.44
	Diamond Viper VLB	OEM Cirrus Logic PCICL543x	Diamond Viper VLB	STB Nitro PCI	integrated VLB
	2/0	0/2	2/0	2/0	0/2
	Optiquest 4000DC	Mag DX15F	Synco CM-17Gs	CTX CMS-1561 LR	NEC MultiSync 3V
	17/.27	15/.28	17/.28	15/.28	15/.28
	n/a	n/a	n/a	n/a	n/a
	○	○	○	Gallant Sound Card SC-6000	○
	○	○	○	Sony CDU 33A-01	○
	n/a	n/a	n/a	300	n/a
	1/2/0/0	1/2/0/1	1/2/0/0	1/2/0/0	1/2/1/1
	1	1	1	1	3
	○	●	●	●[7]	●
	$100	○[8]	○	$25	free
	1	2	3	2	2
	9[9]	14	10	10	12
	○	●	●[10]	○	○
	○	●	○	○	●
	●	●	●	●	●

[7]45-day money-back guarantee.
[8]Free on-site service in Arizona only.
[9]Not toll free.
[10]Saturdays only.

MPC offers an optional docking station. Service policies are typical, except for limited technical support hours—only 9 hours each day, weekdays only. All in all, the 380 is a good portable. With longer battery life, it could well have made it into either the power or budget sections of our Mobile PCs Top 20. *MPC Technologies, 800/672-8088, 714/724-9000* **Reader service no. 736**

NEC Image 4100es

PC WORLD TOP 20
6 POWER DESKTOP

PROS: Fastest DX4-100 yet, nice monitor
CONS: Limited expandability, flimsy case

Savvy system connoisseurs know that NEC makes excellent systems. But they're just as aware that the company often charges a premium for them. The Image 4100es is a pleasant exception, a member of this month's Power Desktops Top 20, and very nearly a Best Buy. It is true that most DX4-100 desktops are cheaper than this $3813 compact. But the Image 4100es, with 16MB of RAM and 256K of secondary cache, is phenomenally fast, blasting by all the Pentium-60s, beating out all but two Pentium-66s, and even edging by some of the slower Pentium-90s we've had in the test center.

NEC didn't sacrifice optimum configuration to achieve its enticing price/performance ratio. You get a roomy 540MB hard drive, and the MultiSync 3V monitor, while NEC's low-end 15-inch offering, still sports exceptionally sharp image quality and good brightness and contrast. Furthermore, the monitor is well matched to a 2MB VL bus video adapter to furnish comfortable viewing in super-VGA resolutions. System documentation is superb.

NEC's service and support is better than most. Policy highlights include a three-year warranty and a reassuring year of free on-site service. Adding to this company's appeal, NEC customers responding to our fax-back survey give the company very favorable marks. So what is there to criticize about this machine? The Image 4100es's only real drawback is its low expandability. Two externally accessible drive bays are at your disposal—and that's not bad at all—but only three of the four available expansion slots are usable; the fourth is obstructed by video memory and the CPU's heat sink. On our test unit, all four SIMM sockets were filled with 4MB SIMMs. So if you expect to expand your RAM in the future, it makes sense to ask your dealer to install higher capacity SIMMs and leave you some room to move. Even if you think you may never upgrade, your situation may change, and you'll be grateful you thought ahead. The only other element we can fault is the case, which allows the motherboard to flex a bit if you move the system around with its cover off.

The bottom line? If you don't need lots of room to upgrade, you'll find everything you're looking for in this high-end office PC: great performance, a solid feature set, and the assurance of NEC quality and backing, all in a pleasingly compact, cost-effective package. Small wonder it wound up high up on our Power Desktops list. *NEC Technologies, 800/632-4636, 508/264-8000* **Reader service no. 737**

FEATURES COMPARISON: THIS MONTH'S CONTENDERS–MOBILE PCs

New AT&T, IBM Mobiles Shoot Straight to the Top

● Yes
○ No
n/a = not applicable

	Acom Patriot 4000	BEST BUY AT&T Globalyst 200 (486DX2-50)	AT&T Globalyst 200 (486SX-33)	Duracom TravelPro5110	BEST BUY IBM ThinkPad 500	Identity Systems Select Series	MPC 380
Standard features							
Selling price as of 6/6/94[1]	$2780	$4105	$2700	$4225	$1798	$2458	$2659
CPU	486DX2-66	486DX2-50	486SX-33	DX4-100	IBM486SLC2-50	486DX-33	486DX2-66
Traveling weight (pounds)[2]	8.4	7.4	7.4	8.6	6.2	8.2	8.4
Width x depth x height (inches)	11.3 x 9 x 2	11.3 x 8.8 x 2.3	11.3 x 8.8 x 2.3	11.2 x 8.6 x 2.3	10 x 7.3 x 1.6	11.3 x 8.9 x 1.9	11 x 8.6 x 2
Installed/maximum RAM (MB)	8/32	8/20	4/20	4/36	4/12	4/32	8/20
Secondary RAM cache installed/maximum (K)	0/0	0/0	0/0	128/128	0/0	0/0	0/0
Installed/maximum hard disk (MB)	330/520	250/250	170/250	200/520	170/260	200/720	320/540
Removable hard disk	○	●	●	●	○	○	○
Display type	color passive	color active	color passive	color active	mono passive	color passive	color passive
Screen diagonal (inches)	9.5	9.5	9.5	9.5	7.5	9.5	10.3
Maximum colors or gray shades of LCD	256	256	256	256	64	256	16
Simultaneous LCD and external monitor	○	●	●	●	●	○	○
Highest resolution of external monitor	1024 x 768	1024 x 768	1024 x 768	1024 x 768	800 x 600	1280 x 1024	1024 x 768
Mouse/keyboard ports	0/1	0/1[3]	0/1[3]	0/1	0/0	0/1	1/1
Cursor keys in inverted T	●	●	●	●	●	●	●
Dedicated page control keys	●	●	●	●	●	●	●
All 12 function keys dedicated	●	●	●	●	●	●	●
Standard <Ctrl> and <Alt> layout	○	●	●	○	○	○	○
Built-in pointing device	●	●	●	●	●	●	●
Modem fax/data speed (kilobits per second)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Docking station available	●	●	●	●	●	●	●
PCMCIA slot Type II/III	0/1[4]	1/1	1/1	1/1	1/0	0/1[4]	0/1[4]
Power management							
Supports APM	●	●	●	○	●	●	●
Type of battery	NiMH	NiMH	NiMH	NiMH	NiMH	NiCd	NiCd
Suspend button	●	●[5]	●[5]	○	●	●	●
Suspends when case closed	●	○	○	○	●	●	○
Service and support							
Warranty (years)	1	1	1	1	3	1	1
30-day money-back guarantee	●	●	●	●	●	○	●
On-site/replacement service price for first year	○	free	free	○	$40	○	○
Turnaround policy (days at service center)	2	2	2	2	3	2	2
Daily toll-free phone support (hours)	11	24	24	11	24	11	9
Weekend support	○	●	●	○	●	○	○
BBS	●	●	●	●	●	●	○
Fax	●	○	○	●	●	●	●

[1] All notebooks priced as configured with DOS 6.0 or later, Windows 3.1, VGA monochrome or better display, and mouse or other pointing device. Selling price is direct or based on vendor estimate.

[2] Includes computer, adapter, and power cord.

[3] Mouse port doubles as keyboard port.

[4] Alternatively accepts two Type II devices.

[5] Suspends with key combination.

I don't understand

my new healthcare plan,

Latin,

my parents,

how tofu can be so popular,

why athletes make

more money than doctors,

why everybody makes

more money than me,

and why anyone would buy

an NEC SuperScript™ 610 printer.

NOVEMBER 1993

BEST VALUE
GENERAL BUSINESS
PRINTER

energy
EPA POLLUTION PREVENTER

RECOMMENDED PRODUCT

$50 REBATE
1/94 THROUGH 9/30/94

Why? Because it's the fastest and easiest personal laser printer you will ever use.

Besides you're smart enough to recognize a good idea when you see one. You're not afraid of new technology. And you're definitely tired of waiting every time you print from Windows.

But still you have your doubts. What exactly is this new technology? And what's in it for you?

Well, it's called GDI printing and it works like this. GDI (Graphical Device Interface) is the native language of Microsoft Windows.™ Because the SuperScript 610 thinks and speaks the same language it doesn't have to translate or reformat your documents before it can print. Which means it's 30% to 300% faster than ordinary printers. And what you see on the screen is truly what you get.

Okay, this is obviously a great Windows printer. But can it print PCL and DOS? Of course. As long as you open the application from within Windows. There's even a $99 PostScript™ option if you need it.

With all this sophisticated technology, you'd expect the 610 printer to be complicated and hard to use. But it's actually much easier to use than ordinary printers. And it only takes minutes to install.

To achieve this kind of ease we did have to eliminate a few things, however. Like the controller. Why have one when the PC can do the file processing? It's faster and more efficient. It also allows you to print fonts and graphics without any limitations. And every time you upgrade your PC, you automatically upgrade your printer.

We also moved the operator panel to the PC screen — where it belongs. That way graphical displays and animated icons can show you exactly what's going on at all times.

By the way, the SuperScript 610 is extremely compact, 300 dpi, prints 6 pages per minute and it comes with a 2-year overnight replacement warranty.

And it costs under $500. What's so hard to understand about that? For more information, call1-800-NEC-INFO or for details via fax, call NEC FastFacts™ at 1-800-366-0476, and request document #SW610.

SuperScript and FastFacts are trademarks of NEC Technologies, Inc. All other trademarks and registered trademarks are the property of their respective owners. The Energy Star emblem does not represent EPA endorsement of any product or service. © 1994 NEC Technologies, Inc. NEC GSA#GSOOK91AGS5241.

NEC

Circle 205 on reader service card

System Snapshots

These systems, while very capable, don't match the preceding group for overall value in a business environment. However, many of them present unique and valuable solutions to end-user needs.

Ares DX4-100

PROS: Decent expandability, good support policies
CONS: Sluggish for a DX4-100

For $3145, Ares offers a nicely decked-out system with a DX4-100 CPU, a 15-inch monitor, a 2MB video board, a 420MB hard drive, and a CD ROM drive. While the system is ready to handle business databases and reference works, if you want a multimedia system, all you need to add is a sound card and speakers. You also have plenty of room in this highly upgradable tower to add other components.

Ares backs its systems with good support policies, including a 60-day money-back guarantee, a two-year warranty, and free labor for the life of the system. You can call technical support 24 hours a day.

Unfortunately, performance is disappointing. Even with 16MB of RAM, the Ares is one of the slowest DX4-100 systems we've seen, running more on a par with a high-performance DX2-66. Those seeking a bargain power PC will find better deals on our Top 20s. *Ares Microdevelopment, 800/322-3200, 810/473-0808* **Reader service no. 738**

Compaq Deskpro XE 450

PROS: Streamlined design, strong support
CONS: Slow, small hard drive, no free drive bays

The Deskpro XE 450 is a svelte office system equipped with CD ROM drive, 16-bit audio, and microphone, all for only $2499. The package includes a 15-inch monitor, a 1MB local bus video controller, 8MB of RAM, and TabWorks, an easy-to-use desktop manager that supplants Windows' program manager. And you get Compaq's excellent service and support.

But the XE 450 has major shortcomings. One is poky performance—it's noticeably slower than the typical DX2-50. Another is its 170MB hard drive, which is on the small side. Furthermore, the system has limited expandability—no free drive bays and only three free expansion slots. These drawbacks keep the system below the level of our Top 20 lists, but the Deskpro XE 450, backed by one of the leading companies in the PC business, may well attract home buyers. *Compaq Computer, 800/345-1518, 713/378-8820* **Reader service no. 739**

DECpc XL560

PROS: Sturdily built, good service and support
CONS: Pricey, sluggish for a Pentium-60

If minicomputer mogul DEC has transferred any expertise to its PC business, it's how to make a sturdy system and support it well. A case in point is the DECpc XL560, a medium tower backed by a company rated exceptionally high in our reliability and service surveys. DEC also offers a long three-year warranty and has tech support reps available 24 hours a day, seven days a week.

Unfortunately, performance is on the slow side for a pricey power system. Despite its 16MB of RAM and 2MB PCI graphics accelerator, this Pentium-60 turned in some of the slowest test scores we've seen in its class. You get a 15-inch monitor and a CD ROM drive but no sound card or speakers. The DECpc XL560 is a robust PC, but for $4995 we expect more. In fact, several better Pentium-90 packages are available for $1000 less. *Digital Equipment Corp., 800/722-9332* **Reader service no. 740**

Hyundai Neuron Lite 425SX

PROS: Great price
CONS: Slow, poor display quality, short battery life, small hard drive, design flaws

Hyundai's subnotebook has its charms. This tiny 6.4-pound Windows-ready PC is enticing, especially in light of its bargain-basement $1514 price. However, the 486SX-25 subnote's test results are exceptionally slow even for a mobile computer. Furthermore, the hard disk is a meager 120MB, and the battery runs for less than 2.5 hours on a charge.

System design also left us flat. The monochrome display on our test unit was streaky, the trackball cramped, and key placement nonstandard. While the PC has an 18-month warranty, tech support is free for only the same length of time and for only 9 hours each weekday. The Neuron Lite 425SX merits a look—if you're on a really tight budget and your mobile computing needs are light. *Hyundai, 800/627-7978, 408/473-9200* **Reader service no. 741**

Wyse Forté GSV

PROS: Ethernet ready, upgradable to full Pentium, 40-month warranty
CONS: Pricey for a DX2-66

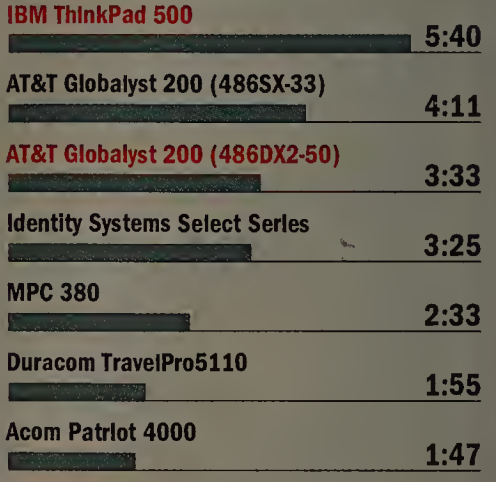
Wyse's entry has two cool features: ethernet connectors and a motherboard with a free Pentium CPU socket, which means you can pump up the system to a true Pentium-60. (Wyse will sell you the CPU for $549.) Given the 16MB of RAM, it's no surprise the Forté GSV proved to be a fast DX2-66.

However, $3349 is a steep price for a DX2-66 PC, especially as the rest of the unit is plain vanilla. The 15-inch monitor, 340MB hard drive, and CD ROM drive are good power system components, but the PC's general expandability is unexceptional.

Wyse's 40-month warranty is fantastic—one of the longest in the business—but support policies are otherwise basic. The Forté GSV has several novel and attractive features, but for this much money, you could buy a similarly configured Pentium-60—without having to start with a DX2-66. *Wyse Technology, 800/438-9973, 408/473-1200* **Reader service no. 742**

BATTERY LIFE TEST REPORT

IBM ThinkPad Tops This Month's Mobile Contenders



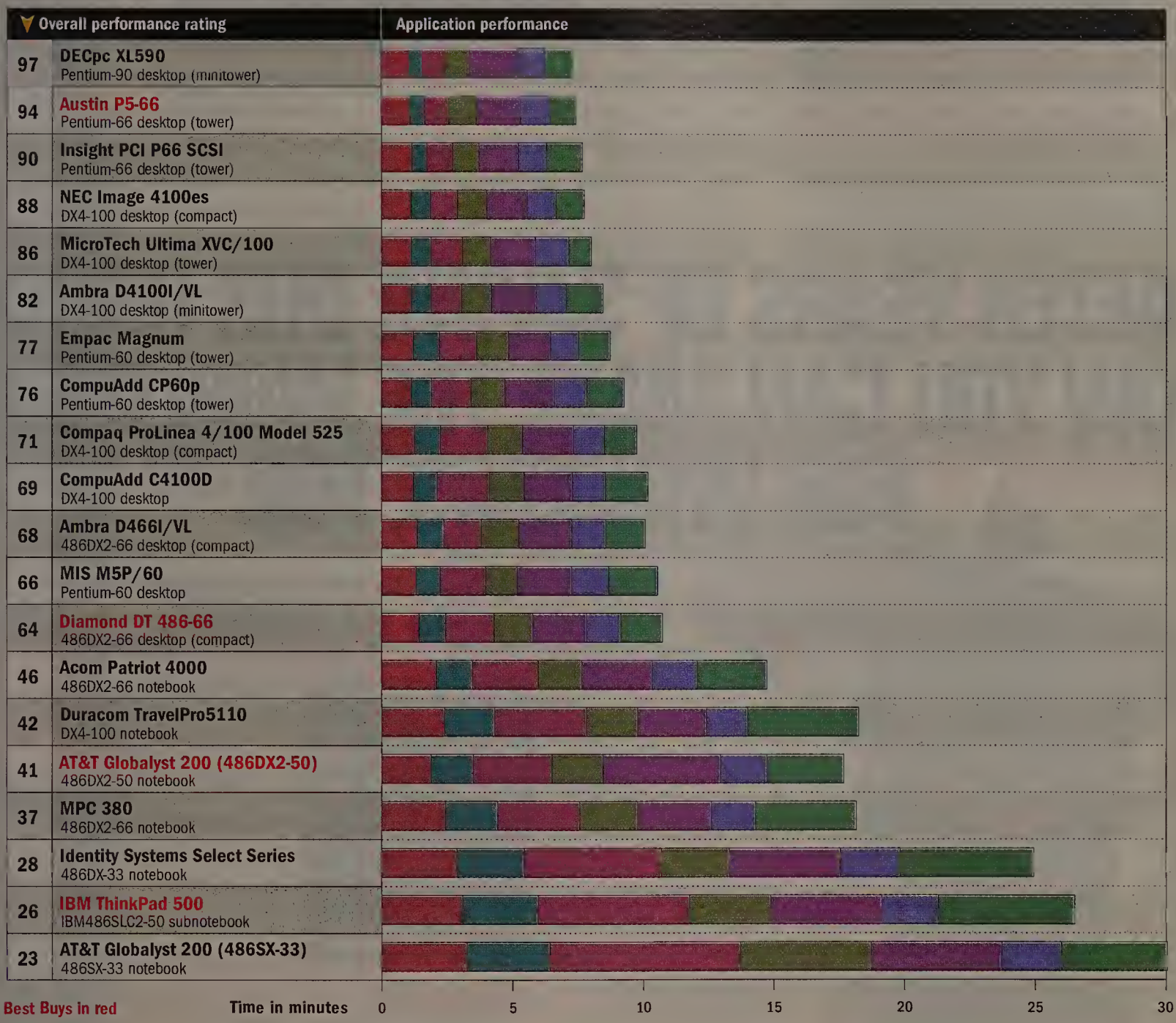
Best Buys in red

Time in hours:minutes.

Methodology
We drain and fully recharge the battery and set power-saving options to match a consistent profile where possible. Office workers type at regular intervals in Word for Windows, saving periodically. Notebooks are rotated among workers to even the work loads. We report the time elapsed until the notebook shuts itself off.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

DEC's 90-MHz Pentium PC Leads This Month's Pack



Systems are arranged in order of overall performance from best to worst, based on the total of the scores from seven normalized, weighted tests. However, slower performance by a system in one test may cause its overall bar to be longer than that of a system with worse overall performance.

Methodology

We tested each system as supplied by the manufacturer, using the version of DOS supplied. If we installed Windows, we performed the default installation. We configured Windows with an HP LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We set video resolution to 800 by 600 pixels in 256 colors, using the supplied video driver where possible. We loaded the test applications and files and test automation software and scripts.

Word 2.0 for Windows

We worked with 1-, 9-, and 28-page business documents. Operations included creating, saving, opening, scrolling, editing, checking spelling, formatting, previewing, and printing.

Excel 4.0

We opened a file and performed several data extracts, entered new data, altered calculations, formatted, scrolled, moved blocks, previewed, printed, and saved.

Paradox 1.0 for Windows

We used a custom form to add a number of records to an existing table, performed several queries, and generated a report.

Freelance 1.0 for Windows

We built a six-page presentation using a standard template, clip art, text, and charts; applied several views to the presentation; and previewed and saved it.

WordPerfect 6.0 for DOS

We performed a variety of editing, formatting, previewing, and printing tasks on documents ranging from a single-page memo to a long report. Due to memory requirements, the amount of free memory for DOS in the first 640K dramatically affects this test.

1-2-3 release 3.4 for DOS

Using the graphical Wysiwyg add-in and working in three different files, we created and altered formulas, built graphs, saved, and printed.

Paradox 3.5 for DOS

We tested Paradox 3.5 running under Windows in a DOS window. We entered data, searched records, updated, and generated reports from a simple customer list.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

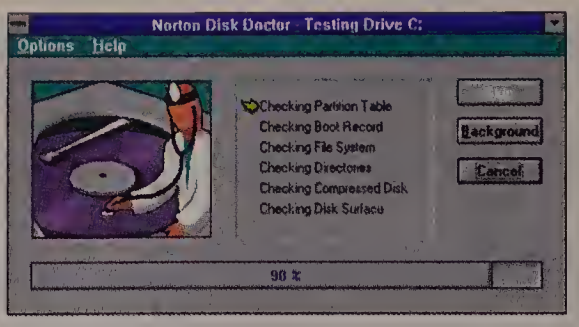
If you've ever owned a copy of Norton Utilities,® you know you don't need a super-hero's cape to have magic-like powers.

Famous for its daring rescues and recoveries, Norton Utilities is one of the most honored software programs in the history of personal computing. And now there's new Norton Utilities 8.0.

The first software package to combine true Windows recovery and configuration management with proven DOS protection and recovery tools.

Whether you or someone you know is having hardware problems, file system problems, DOS or Windows OS problems, Norton Utilities 8.0 gives you all the tools you need for diagnostics and repair in one great package.

Like Speed Disk, Norton Disk Doctor runs in the background.



Our new System Watch monitors virtually everything going on within your Windows environment. What's more, it provides real-time crash protection by alerting you to any potentially dangerous situations that could result in system failure and the loss of your data.

There are still several other new Windows utilities for trouble-shooting and repairing even the most challenging of Windows problems. Including INI Tuner, INI Tracker, INI Advisor, INI Editor and File Compare. And there are all the classic DOS utilities you've come to rely upon.

A Monumental New Upgrade.

Both Speed Disk™ and Disk Doctor® now operate in the background. Providing continuous disk optimization and file system analysis and repair.

You'll find support for the widest range of compression formats under both DOS and Windows. In addition, there's a complete diagnostic tool set for analyzing all of your computer's hardware components from drives to video.

There's also our new Interrupt Conflict testing to help eliminate conflicts and their subsequent lock-ups and to make it easier for you to install new devices on your system.

It all adds up to a major upgrade that InfoWorld rated a staggering 9.4 out of 10 in their May 9, 1994 review.

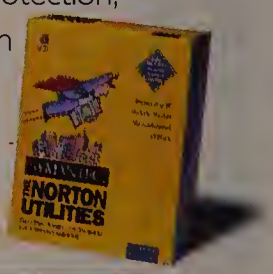
And, if you are one of those MIS super-heroes, ask about our new Norton Utilities Administrator.™ It's the fast and easy way to distribute Norton Utilities 8.0 to every desktop in your office.

Just zap on over to your local computer retailer or visit your software store today.

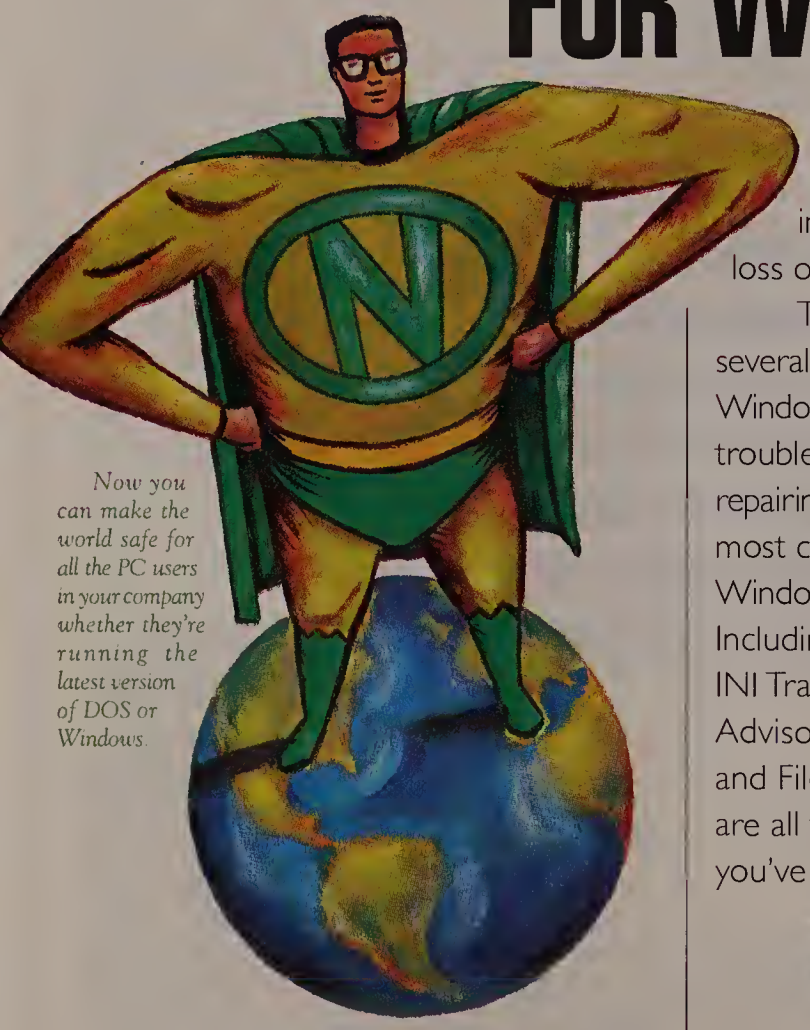
Or to receive more detailed purchasing information, call us at 1-800-628-4777, ext. 9219.*

So for maximum protection, always boot your PC with Norton Utilities 8.0 at the start of your day.

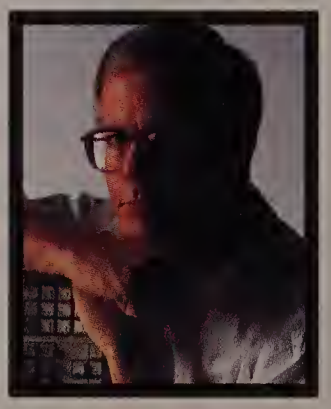
It'll make your world a happier and safer place.



After Years Of Saving DOS Users, Now You Can Make The World Safe For Windows, Too.



Now you can make the world safe for all the PC users in your company whether they're running the latest version of DOS or Windows.



The pioneer of data protection and recovery brings you the new improved Norton Utilities 8.0.

SYMANTEC.®

*For more information in Canada, call 1-800-667-8661. Symantec, Norton Utilities and Norton Disk Doctor are registered trademarks of Symantec Corporation. Norton Utilities Administrator and Norton Speed Disk are trademarks of Symantec Corporation. All other brand names or trademarks are the property of their respective holders. ©1994 Symantec Corporation. All rights reserved.

Almost Like Getting 7 Issues FREE!

PC WORLD Savings Certificate

☑ **Yes,** sign me up to receive the next 12 monthly issues of PC WORLD and bill me for only $19.97. Rush me my FREE Bonus PowerBase*.* Disk, packed with 50 utilities not available anywhere else!

Single Copy Price $47.40
Your Price $19.97
YOU SAVE $27.43*
*Over 58% off!

Name (please print) _____

Company _____

Address _____

City _____

State _____ Zip _____

4LEF2

Basic annual subscription price $29.90. Savings based on annual newsstand price of $47.40. Please allow 6-8 weeks for delivery of your first issue. Foreign orders add $46 postage. Canadian orders add $20 postage plus 7% GST.

FREE BONUS Disk with 50 Utilities:

Invaluable tips, tricks, macros and more for all the best software. Not available in stores at any price, but it's yours FREE just for ordering PC WORLD.

Phone 800 825-7595 ext. 501
Fax 415 882-0936 or Mail Today

Like Getting 8 Issues FREE!

MULTIMEDIA WORLD SAVINGS CERTIFICATE*

Single Copy Price $47.40
YOUR PRICE—A LOW $14.97
YOU SAVE $32.43*
*Over 68% off!

Free Bonus CD-ROM

with 80 megabytes of fabulous clip-art with your paid subscription to MULTIMEDIA WORLD.

Phone 800 766-3294 x 205
Fax 415 882-0936 or Mail Today

☑ YES, I want to receive the next 12 issues of cutting edge multimedia news and information. Send me a one year subscription to MULTIMEDIA WORLD and bill me for only $14.97. Send me my FREE Bonus Aris Entertainment CD-ROM, packed with 80 megs of fantastic clip art after you receive my payment.

Name (please print) _____

Company _____

Address _____

City _____

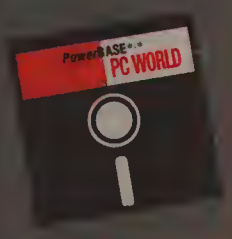
State _____ Zip _____

❑ Payment enclosed. I can't wait. Rush my FREE CD-ROM now!

Savings based on annual newsstand price of $47.40. Please allow 6-8 weeks for delivery of your first issue. Foreign orders add $46 postage. Canadian orders add $20 postage plus 7% GST.

4AD26

Like Getting 8 Issues FREE!



FREE PowerBase*.* Disk with 50 Utilities

CALL TODAY

1-800-825-7595

EXT. 501

PC WORLD at over 58% off! It's almost like getting 7 ISSUES absolutely FREE!

GET YOUR FREE BONUS DISK WITH 50 UTILITIES:
Invaluable tips, tricks, macros and more for all the best software. Not available in stores at any price, but it's yours FREE just for ordering PC WORLD.

❑ YES, sign me up to receive the next 12 monthly issues of PC WORLD and bill me for only $19.97. Just for ordering, rush me my FREE Bonus PowerBase*.* Disk, packed with 50 utilities not available anywhere else!

Name (please print) _____

Company _____

Address _____

City _____ State _____ Zip _____

PC WORLD

Basic annual subscription price $29.90. Savings based on annual newsstand price of $47.40. Please allow 6-8 weeks for delivery of your first issue. Foreign orders add $46 postage. Canadian orders add $20 postage plus 7% GST.

4LEF2

Rush my
FREE DISK
and first issue!

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED
STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD

SUBSCRIPTION DEPARTMENT
P.O. BOX 51833
BOULDER, CO 80321-1833

PC WORLD Guarantee

If you are not completely delighted, just tell us, and you will receive a full refund for all unmailed issues.

Rush my
FREE CD-ROM
today!

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED
STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MULTIMEDIA WORLD

SUBSCRIPTION DEPARTMENT
P.O. BOX 58690
BOULDER, CO 80323-8690

SAVE $32.43
Off The Cover Price of MULTIMEDIA WORLD

PRIORITY HANDLING
Please Rush
FREE DISK!

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED
STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD

SUBSCRIPTION DEPARTMENT
P.O. BOX 51833
BOULDER, CO 80321-1833

DON'T DELAY!

Call to Receive Your Free Disk Today!

Beyond the Top 20: Ranking the Rest of the Pack

Considering buying a Rampage 486DX2-66 PC but can't find it on our Top 20 charts? Chances are, we've reviewed it. In the course of testing systems for the PC World Top 20 during the last eight months, we've rated more than 280 machines—desktops and notebooks. The following two charts rank them all, from budget 486SX-25s to the newest Pentium-90s, with the exception of models no longer on the market. We list power and budget ranks, the system's CPU class, its street price, the issue in which it was reviewed, and the vendor's phone number. Simply scan the chart for the computer you're interested in. Check its power rank to see how it compares to the Top 20 power systems. If it's number 21, it's worth considering; if it's number 121, cross it off your list. Then check the system's budget rank. If no budget rank is listed, the machine exceeds our price ceiling for budget category eligibility: $2500 for desktops and $2750 for notebooks. All prices listed are accurate as of mid-June.

Finally, more detail about each PC is available in the issue in which it was reviewed. Consult your back issues or order a reprint by fax. Instructions for ordering fax reprints appear at the bottom of each Top 20 chart in the review.

THE TOP 20 PC WORLD Power and Budget Desktop PCs

SYSTEM	POWER RANK	BUDGET RANK	CPU	PRICE	ISSUE REVIEWED	PHONE NUMBER
Acer AcerPower 9000T	52	–	Pentium-60	$3629	July 94	800/733-2237
Acer AcerPower Series 9000	50	–	Pentium-60	$4795	Jan 94	800/733-2237
Acma 486/66/DX2 System	76	–	4860X2-66	$2595	Jan 94	800/786-6888
Acma 486DX2-66 PCMCIA System	84	11	486DX2-66	$1995	May 94	800/786-6888
Acma MPC-433 System	149	54	4860X-33	$1850	Apr 94	800/786-6888
Alaris Leopard EnergySmartPC SLC2/66	162	77	18M 486SLC2-66	$1679	July 94	510/770-5700
ALR Evolution IV 4/100	42	–	0X4-100	$2889	July 94	800/444-4257
ALR Evolution V	18	–	Pentium-60	$3761	Jan 94	800/444-4257
ALR Evolution V-Q	46	–	Pentium-60	$5777	Mar 94	800/444-4257
ALR Evolution V ST/66	25	–	Pentium-66	$4300	June 94	800/444-4257
ALR Flyer VL 4/50d	121	42	4860X2-50	$2291	Jan 94	800/444-4257
Ambra D4100l/VL	15	–	0X4-100	$3034	Sept 94	800/252-6272
Ambra D466l/VL	32	12	4860X2-66	$2460	Sept 94	800/252-6272
Ambra DP60E/VL	55	–	Pentium-60	$3365	Mar 94	800/252-6272
Ambra DP60/PCI	63	–	Pentium-60	$3317	May 94	800/252-6272
Ambra T466l/VL	56	–	4860X2-66	$2510	July 94	800/252-6272
Ares 486-66DX2 EISA/VESA	86	34	4860X2-66	$2499	Jan 94	800/322-3200
Ares DX4/100	68	–	0X4-100	$3145	Sept 94	800/322-3200
AST Bravo MT 466d	94	17	4860X2-66	$2128	Feb 94	800/876-4278
AST Premmia 4/66d Model 343W	62	–	4860X2-66	$3593	Jan 94	800/876-4278
AST Premmia 4/66d Multimedia	123	–	486DX2-66	$3955	May 94	800/876-4278
AST Premmia LX P/60	22	–	Pentium-60	$4098	July 94	800/876-4278
ATronics PCI Emerald	64	6	4860X2-66	$1995	July 94	800/488-7776
ATS AMI Multimedia 486-66	118	–	486DX2-66	$3995	Feb 94	619/279-1305
AT&T/NCR 3230 Local 8us	151	68	486SX-33	$1965	Dec 93	800/637-2600
AT&T/NCR System 3230	128	46	4860X-33	$2265	Mar 94	800/637-2600
AT&T/NCR System 3333	91	–	4860X2-66	$2895	Jan 94	800/637-2600
AT&T/NCR System 3333	132	59	486DX-33	$2465	Feb 94	800/637-2600
Austin Genesis 4860X-33	160	65	486DX-33	$1499	July 94	800/752-1577
Austin P5-66	3	–	Pentium-66	$3298	Sept 94	800/752-1577
Austin Power System 60	24	5	Pentium-60	$2258	Mar 94	800/752-1577
Austin Premier 486 System	89	9	4860X2-66	$1984	June 94	800/752-1577
Axik 486DX2-66PCI	75	13	486DX2-66	$2198	Mar 94	800/234-2945
Axik 4860X2-66V	119	44	4860X2-66	$1998	Dec 93	800/234-2945
Axik AceCache 4860X2-66VG	112	35	4860X2-66	$1995	Feb 94	800/234-2945
Axik AceCache 586-66PCI/MPC	23	–	Pentium-66	$3999	June 94	800/234-2945
Axik AcePower 586-90V	27	–	Pentium-90	$3838	Aug 94	800/234-2945
Blackship BLK 4860X2/50 L8	139	51	4860X2-50	$1795	Mar 94	800/531-7447
Blackship BLK 4860X2/66 L8	116	33	4860X2-66	$1895	Jan 94	800/531-7447
Blackship BLK 4860X/33 L8	159	70	4860X-33	$1495	Dec 93	800/531-7447
Blackship BLK P60 L8	71	–	Pentium-60	$2795	Apr 94	800/531-7447
CAF Master L737 0X2/66	129	58	4860X2-66	$2100	Jan 94	818/369-3690
Caliber-Aspect Smart Weapon 486-66	95	32	4860X2-66	$2298	Feb 94	800/348-2773
Canon Innova 486v	170	87	4860X2-66	$2258	Mar 94	800/848-4123
Compaq Deskpro 5/60M	92	–	Pentium-60	$7000	Jan 94	800/345-1518
Compaq Deskpro XE 433s	130	55	486SX-33	$2399	May 94	800/345-1518
Compaq Deskpro XE 450	131	56	4860X2-50	$2449	Sept 94	800/345-1518
Compaq Deskpro XE 466	73	–	4860X2-66	$3228	Aug 94	800/345-1518
Compaq Deskpro XE 560	31	–	Pentium-60	$4189	July 94	800/345-1518
Compaq Presario 425	171	83	486SX-25	$1449	Dec 93	800/345-1518
Compaq Prolinea 4/100	28	–	0X4-10D	$3548	Sept 94	800/345-1518
Compaq Prolinea MT 4/33s	133	28	486SX-33	$1995	Aug 94	800/345-1518
Compaq Prolinea MT 4/66	82	–	4860X2-66	$2765	May 94	800/345-1518
Compaq Prolinea Net1/25s	173	86	486SX-25	$1400	May 94	800/345-1518
CompuAdd C41000	39	–	0X4-100	$2691	Sept 94	800/627-1961
CompuAdd C433S	135	25	486SX-33	$1670	Dec 93	800/627-1961
CompuAdd C4660	36	2	4860X2-66	$2195	May 94	800/627-1961
CompuAdd C4660 Mini-Tower	60	–	4860X2-66	$2798	June 94	800/627-1961
CompuAdd CP60p	13	–	Pentium-60	$3407	Sept 94	800/627-1961
Comtrade EISA VL8 4860X2/66	143	62	486DX2-66	$1795	Dec 93	800/969-2123

■ September Top 20 systems

Power and Budget Desktop PCs continued

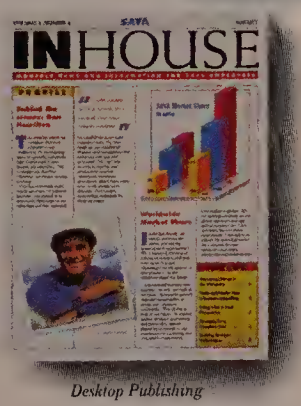
SYSTEM	POWER RANK	BUDGET RANK	CPU	PRICE	ISSUE REVIEWED	PHONE NUMBER
Comtrade VLB WinXpress	127	37	4860X2-66	$1650	May 94	800/969-2123
Cornell Power Pak	156	74	4860X2-66	$1595	June 94	800/886-7200
CSP 486 Medium Tower	109	30	4860X2-66	$1995	Mar 94	800/950-6660
DEC DECpc LPv+ 466d2	80	–	4860X2-66	$2737	Aug 94	800/722-9332
DEC DECpc XL 466d2	49	–	486DX2-66	$4968	Feb 94	800/722-9332
DEC DECpc XL560 Medium Tower	59	–	Pentium-60	$4995	Sept 94	800/722-9332
OEC OECpc XL590	8	–	Pentium-90	$5098	Sept 94	800/722-9332
Oell Oimension 450SV	122	47	486SX2-50	$2378	Aug 94	800/289-3355
Oell Dimension XPS P90	1	–	Pentium-90	$3828	July 94	800/289-3355
Dell NetPlex 433/P	155	79	486DX-33	$2198	Feb 94	800/289-3355
Dell Dmniplex 590	51	–	Pentium-90	$7469	Aug 94	800/289-3355
Dell OptiPlex 4100/L	47	15	0X4-100	$2499	June 94	800/289-3355
Oell OptiPlex 433/LV	124	49	486DX-33	$2289	June 94	800/289-3355
Oell OptiPlex 450s/L	79	7	486SX2-50	$1957	Aug 94	800/289-3355
Oell OptiPlex 466/MXV	41	–	486DX2-66	$3020	Apr 94	800/289-3355
Diamond 486C-40 VL	158	61	Cx486S40	$1400	Oec 93	800/989-7253
Diamond OT 486-66	40	1	4860X2-66	$1699	Sept 94	800/989-7253
Diamond DT 486DX2-66 VL-SCSI	104	41	4860X2-66	$2379	Jan 94	800/989-7253
Oiamond OT 586-90	26	–	Pentium-90	$2815	Aug 94	800/989-7253
Oolch A-Pac 586-60C	153	–	Pentium-60	$9995	May 94	800/538-7506
OTK Feat-33	154	60	Am486DX2-50	$1595	Mar 94	800/289-2385
OTK Feat-38	110	18	4860X2-66	$1900	Aug 94	800/289-2385
OTK Grafika-4V2D-S2	161	69	486SX-25	$1599	Dec 93	800/289-2385
Duracom Multimedia DeskSaver 486/66DX2V	125	–	486DX2-66	$3223	Apr 94	800/551-9000
Eltech Splendor III	115	53	IBM BL 25-75	$2499	May 94	510/438-0990
Empac Magnum	35	–	Pentium-60	$3500	Sept 94	510/226-4732
Epson Endeavor WG 4DX2/66	111	29	486DX2-66	$2158	Feb 94	800/374-7300
Everex Step VL EISA DX2/66	61	8	4860X2-66	$2249	Oec 93	800/821-0806
Gateway P4D-66 Best Buy	21	4	4860X2-66	$2299	June 94	800/846-2000
Gateway P5-60 Best Buy	14	–	Pentium-60	$2545	May 94	800/846-2000
Gateway P5-66	7	–	Pentium-66	$3430	June 94	800/846-2000
Gateway P5-90	5	–	Pentium-90	$3830	July 94	800/846-2000
Hertz 486/D66X2e	140	–	486DX2-66	$2700	May 94	800/232-8737
Hertz 486/066X2e Multimedia System	85	–	486DX2-66	$3995	Feb 94	800/232-8737
Hewlett-Packard Vectra 486/33VL	150	78	4860X-33	$2298	Mar 94	800/322-4772
Hewlett-Packard Vectra VL2 4/100	37	–	0X4-100	$2859	July 94	800/322-4772
Hewlett-Packard Vectra VL2 4/50	136	40	486DX2-50	$1969	June 94	800/322-4772
IBM PS/1 Consultant 0X2-66	103	21	486DX2-66	$2315	Feb 94	800/772-2227
IBM ValuePoint 433DX/Si	168	84	486DX-33	$1730	Feb 94	800/772-2227
IBM ValuePoint P/60D	9	–	Pentium-60	$3849	Jan 94	800/772-2227
IBM ValuePoint Performance Series	16	–	DX4-100	$4168	Aug 94	800/772-2227
Image Microsystems 4860X-33VLB	157	64	486DX-33	$1495	Mar 94	800/729-3400
Inmac Insignia 450SL Home/Office	165	75	IBM 486SLC2-50	$1598	Apr 94	800/547-5444
Insight PCI P60 CD	54	–	Pentium-60	$3490	May 94	800/998-8011
Insight PCI P66 SCSI	19	–	Pentium-66	$3678	Sept 94	800/998-8011
Insight VL 486DX2-66 MM	107	–	486DX2-66	$3195	Mar 94	800/998-8011
Intergraph TD-3	105	–	Pentium-90	$9500	Aug 94	205/730-8301
International Instrumentation Blue Max Business Partner	106	48	4860X2-66	$2398	Mar 94	800/543-3475
Micro Express MicroFlex-PCI/66	69	23	486DX2-66	$2480	Apr 94	800/989-9900
Micro Express MicroFlex-VL/Pentium	38	–	Pentium-66	$4495	June 94	800/989-9900
Micron 4100PCI Magnum	12	–	DX4-100	$2599	Aug 94	800/438-3343
Micron 466 VL Powerstation C0	43	–	486DX2-66	$3479	Mar 94	800/438-3343
Micron P6D PCI PowerStation	20	–	Pentium-60	$4138	May 94	800/438-3343
Micron P90PCI PowerStation	11	–	Pentium-90	$4599	Aug 94	800/438-3343
MicroSource Tempest 486 PCI	83	–	4860X2-66	$2685	May 94	800/848-5161
MicroSource Tempest Premier/PCI	66	19	Pentium-60	$2375	July 94	800/848-5161
Microtech Ultima XVC4/100	34	–	0X4-100	$4121	Sept 94	404/345-6508
MidWest Micro 4860X2-66	102	14	Am486DX2-66	$1899	July 94	800/728-8582
MIS M486-33	164	80	486DX-33	$1750	Feb 94	800/733-9188
MIS M466 PCI	108	43	4860X2-66	$2373	July 94	800/733-9188
MIS M466I	74	20	486DX2-66	$1999	Feb 94	800/733-9188
MIS M5P/60	45	–	Pentium-60	$2700	Sept 94	800/733-9188
MIS Promis SL-66V	96	–	4860X2-66	$4195	Oec 93	800/733-9188
NEC Image 4100es	6	–	0X4-100	$3813	Sept 94	800/632-4636
NEC Image 466es	53	–	4860X2-66	$2998	Jan 94	800/632-4636
NEC Image P60 Pentium	67	–	Pentium-60	$5395	Mar 94	800/632-4636
NEC PowerMate 466	99	39	486DX2-66	$2398	Dec 93	800/632-4636
Netis N433VL	138	26	4860X-33	$1500	Dec 93	800/577-7526
Netis N466VG	97	45	486DX2-66	$2498	Mar 94	800/577-7526
Netis N486VL Power Station	120	27	486DX2-66	$1800	Feb 94	800/577-7526
NMC Pro-System 4100	29	10	DX4-100	$2409	Aug 94	800/424-2983
NMC Pro-System PCI 466	44	–	486DX2-66	$2750	Apr 94	800/424-2983
NMC Universal Pro-System 466	100	–	486DX2-66	$3065	Jan 94	800/424-2983
NMC Universal Win-Station	141	38	4860X-33	$1659	Dec 93	800/424-2983
NuTek Ouet 4860X2/66	142	–	4860X2-66	$3195	Mar 94	408/973-8799
Packard Bell 486SX/33	169	81	486SX-33	$1459	Dec 93	800/733-4411
Packard Bell Pentium Computer	33	–	Pentium-60	$2995	July 94	800/733-4411
Polywell Poly 486-40DX	88	3	Am486DX-40	$1600	June 94	800/999-1278
Polywell Poly 486-66EV	78	–	4860X2-66	$3995	Mar 94	800/999-1278
Polywell Poly 486-66VC	101	–	486DX2-66	$3475	Jan 94	800/999-1278
Polywell Poly 486-66VR	90	22	486DX2-66	$2095	Dec 93	800/999-1278
Polywell Poly 586-66VLB	30	–	Pentium-66	$3495	May 94	800/999-1278
Polywell 586-90VIP	10	–	Pentium-90	$4089	Aug 94	800/999-1278
Quantex Q4860X2/66MM-4	77	16	486DX2-66	$2259	June 94	800/288-0566
Samsung PowerMaster S0966L	117	36	486DX2-66	$2159	May 94	800/446-0262
Shasta Prestige Oesktop	113	24	486DX2-66	$1795	Apr 94	510/249-9900
Solmicro Arena iV466	145	72	4860X2-66	$2199	July 94	510/656-5440
Tagram Concerto HiNote 4860X2-66	114	31	4860X2-66	$1999	Jan 94	714/258-3222
Tagram HiNote 14	147	57	4860X-33	$1999	Mar 94	714/258-3222
Tagram TopNote 15	134	66	486DX2-50	$2349	Apr 94	714/258-3222

■ September Top 20 systems

Science has found a cure for snoring. At least during your presentation.

It's the new Phaser™ 220 color printer by Tektronix®. It's affordable. It's easy to use. And it's the best way to keep people awake without the use of costly stimulants. How? Quite simply, amazing color. The Phaser 220's SuperCell 600™ technology allows you to print a whopping 600 x 300 dots-per-inch. And in lay terms, that's a lotta dots. And a lotta dots means your annual reports will yodel, your pie charts will do backflips and your bar graphs will announce their presence with authority. Plus you get all this great color at two pages per minute on most common laser papers. At this speed, it should come with an airbag. The Phaser 220 also offers true Adobe® PostScript™ Level 2 and supports PCs, Macs, workstations and just about every network interconnect. Add to this the fact that it's reliable, has multiple paper trays and a huge print capacity and you've got yourself one tough workhorse. For a free Phaser 220 print sample or the name of your nearest Tektronix dealer, call **800-835-6100**, department 341. For faxed information, call 503-682-7450, and ask for document #5003. But don't wait too long. Because business is getting more and more competitive. And if you snooze, you lose.

Overheads



Desktop Publishing

Reports

The Phaser 200 series starts at a suggested retail price of only $2,995. Who says money can't buy happiness?

Tektronix

Phaser is a trademark of Tektronix, Inc. PostScript is a trademark of Adobe Systems, Inc. All other marks are trademarks or registered trademarks of their respective companies.

Circle 124 on reader service card

Power and Budget Desktop PCs continued

SYSTEM	POWER RANK	BUDGET RANK	CPU	PRICE	ISSUE REVIEWED	PHONE NUMBER
Tandy 3100 Model 10	172	85	486SX-33	$1479	Mar 94	817/390-3011
Tandy Omni II	144	–	486DX2-66	$2685	Feb 94	817/390-3011
Tangent Pentium P560	57	–	Pentium-60	$3043	July 94	800/800-5550
Tangent VL 466	146	63	486DX2-66	$1895	Feb 94	800/800-5550
Tri-Star 486DX2/66 VL Station	93	–	486DX2-66	$3159	Jan 94	800/800-2690
Tri-Star 486DX2/66 Tower MPC	98	–	486DX2-66	$3786	Mar 94	800/800-2690
Unisys PW2 Advantage Plus Model 4666	81	–	486DX2-66	$5698	Jan 94	800/874-8647
VTech Platinum 486DX2/66	48	–	486DX2-66	$2995	June 94	800/815-0070
Wyse Forte GSV	65	–	486DX2-66	$3349	Sept 94	408/473-2013
Xinetron X/LAN Station 316 486DX2-50	137	52	486DX2-50	$1775	Apr 94	800/345-4415
Xinetron X/LAN Station 486DX2/50	163	76	486DX2-50	$1725	Feb 94	800/345-4415
Xinetron X/LAN Station DX2/66	126	67	486DX2-66	$2450	Feb 94	800/345-4415
ZDS Z-Station 500	70	–	486DX2-66	$3048	Aug 94	800/553-0331
Zeos 486DX2-66	17	–	486DX2-66	$2537	June 94	800/554-5220
Zeos Ambra Model 486SX-25	166	73	486SX-25	$1391	Mar 94	800/554-522D
Zeos Pantera 66	4	–	Pentium-66	$3395	June 94	800/554-5220
Zeos Pantera 9D	2	–	Pentium-90	$3595	Aug 94	800/554-5220

THE TOP 20 PC WORLD Power and Budget Mobile PCs

SYSTEM	POWER RANK	BUDGET RANK	CPU	PRICE	ISSUE REVIEWED	PHONE NUMBER
Acer AcerNote 780cx	4	–	DX4-75	$3979	Aug 94	800/848-2237
Acer AcerPower 9000T	–	31	Am4860X2-66	$2000	July 94	800/848-2237
Acom Patriot 4000	20	–	486DX2-66	$2780	Sept 94	800/898-2665
Acom VESA-4000	22	–	486DX2-66	$4250	July 94	800/898-2665
Ambra N75D-340	2	–	DX4-75	$3199	Aug 94	800/252-6272
Aquiline Hurricane	5	–	486DX2-66	$5400	Aug 94	518/272-0421
Arche NP-602	59	24	486SLC-33	$1499	May 94	800/437-1688
Aspen 486 Color SubNote	58	27	486SX-25	$2295	May 94	800/472-3273
AST 8ravo N8 4/33s	36	12	486SX-33	$2335	June 94	800/876-4278
AT&T 3150 *	64	–	486SX-25	$2860	Apr 94	800/637-2600
AT&T Globalyst 2D0 (486DX2-50)	1	–	486DX2-50	$4105	Sept 94	800/637-2600
AT&T Globalyst 200 (486SX-33)	23	7	486SX-33	$2700	Sept 94	800/637-2600
AT&T Safari 3180 *	42	–	486SL-33	$4530	Apr 94	800/637-2600
AT&T Safari 3181 4/50s	14	–	486DX2-50	$4798	Aug 94	800/637-2600
Austin 466T	15	–	486DX2-66	$4099	Apr 94	800/752-1577
8lackship 8LK 486/33A NB	48	–	486DX-33	$3375	May 94	800/531-7447
CAF Aqualite 4SX2/120	53	19	486SX-25	$1396	Apr 94	818/369-3690
Compaq Concerto 4/33 Model 250	29	5	486SL-33	$2428	Apr 94	800/345-1518
Compaq Contura Aero 4/33C Model 170	12	3	486SX-33	$2425	July 94	800/345-1518
Compaq LTE Lite 4/25E	37	–	486SL-25	$3259	June 94	800/345-1518
Dell Latitude 433C-170	32	–	486SX-33	$2999	Aug 94	800/289-3355
Dual Group SKD 486 Notebook	52	23	486DX-33	$1820	Apr 94	800/214 9467
Duracom TravelPro 5110	24	–	DX4-100	$4050	Sept 94	800/551-9000
Epson ActionNote 4000	62	26	486SLC-33	$1499	Apr 94	800/374-7300
Ergo SubBrick 486	61	21	Cx486SLC25	$1579	Apr 94	800/633-1925
Gateway ColorBook 0X2-40	13	6	486DX2-40	$2699	July 94	800/846-2000
Gateway ColorBook DX2-50	7	–	486DX2-50	$2995	July 94	800/846-2000
Gateway ColorBook DX4-75	3	–	DX4-75	$3495	Aug 94	800/846-2000
Gateway Handbook DX2-40	35	8	486DX2-40	$2499	Aug 94	800/846-2000
Hyundai Neuron Lite 425SX	50	14	486SX-25	$1514	Sept 94	408/894-9764
IBM ThinkPad 355	11	2	486SX-33	$2099	Aug 94	800/426-7735
IBM ThinkPad 500	16	1	IBM 486SLC2-50	$1798	Sept 94	800/426-7735
IBM ThinkPad 750C	10	–	486SL-33	$5499	Apr 94	800/426-7735
IBM ThinkPad 750Cs	17	–	486DX-33	$3899	June 94	800/426-7735
IBM ThinkPad 750P	30	–	486SL-33	$4654	May 94	800/426-7735
IBM ThinkPad 750P	34	–	486SL-33	$3749	July 94	800/426-7735
Identity Select Series	28	11	486DX-33	$2458	Sept 94	210/820-3070
Intelligent EchoPad 486SX-25	54	16	486SX-25	$1425	July 94	408/748-9781
Micro Express NB8266	31	–	486DX2-66	$4449	Apr 94	800/989-9900
MPC 380	18	13	486DX2-66	$2659	Sept 94	714/724-9000
NEC Versa 75EC	6	–	DX4-75	$5000	July 94	800/632-4636
NEC Versa E	38	–	486DX2-50	$5199	Apr 94	800/632-4636
Packard Bell Statesman 200C	55	20	Cx486SLC-33	$2000	Apr 94	800/733-5858
Packard 8ell Statesman 200M	56	17	486SLC-33	$1495	Apr 94	800/733-5858
Sharp PC-8150	40	15	486DX-33	$2499	Apr 94	800/237-4277
TI TravelMate 4000E WinDX2/50 Active	19	–	486DX2-50	$3399	Apr 94	800/527-3500
TI TravelMate 4000E WinDX2/50 Dual	21	–	486DX2-50	$2800	June 94	800/527-3500
TI TravelMate 4000E WinDX4/75 Active	9	–	DX4-75	$4999	June 94	800/527-3500
TI TravelMate 4000E WinSX/25 Color	47	10	486SX-25	$1800	June 94	800/527-3500
Toshiba Portégé T3400	26	4	486SX-33	$2188	June 94	800/334-3445
Toshiba Portégé T3400CT	25	–	486SX-33	$3399	Apr 94	800/334-3445
Toshiba Satellite T1950CS	51	22	486DX2-40	$2499	Apr 94	800/334-3445
Toshiba T4700CT 486 Notebook	8	–	486DX2-50	$4549	Apr 94	800/334-3445
Tri-Star Design8ook	27	–	486DX2-66	$4000	June 94	800/800-7668
Twinhead SlimNote 486E 4DX2/66T	43	–	486DX2-66	$4399	May 94	800/995-8946
Twinhead SlimNote 486E 4SX/33S	44	18	486SX-33	$2500	Apr 94	800/995-8946
ZDS Z-Lite 486-25	49	9	486SL-25	$1599	Apr 94	800/553-0331

■ September Top 20 systems

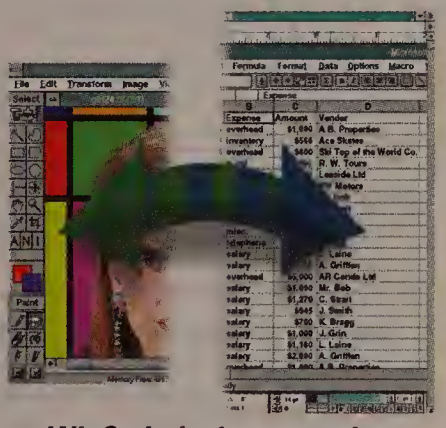
* Tested but not reviewed.

Paul - Manager/Parent :

"I needed a performance boost for my PC. It took a long time for my charts and presentations to appear on the screen. The colors were flat and limited. And my son's games ran slowly. But, I wasn't ready to buy a whole new system.

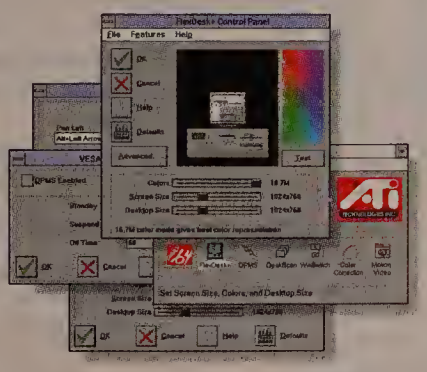
"Fortunately, I got great advice. For *just $299***, I got ATI's GRAPHICS XPRESSION. It revived my whole system.

"My friend had one. Windows snapped open quickly. Charts popped up on his screen. The *blazing speed,* 37M Winmarks*, was incredible. He said it offered *best value for price/performance.* And the improvement in color graphics and detail were most impressive.



WinSwitch changes color and resolution without leaving Windows

"Then, he showed me the features. WinSwitch allowed him to switch between true color mode or high resolution mode without exiting Windows. And ATI's FlexDesk+ software gave him *total control* over color, desktop size, resolution and even motion video acceleration.



FlexDesk+ easy control of desktop settings

"Finally, he told me it was the only affordable 64-bit accelerator for my ISA system. I rushed out to buy one. *Installation was easy.* There were no switches to set and the software guided me through the installation process. And I was amazed, it even came with a complete set of drivers for Windows, Windows NT, OS/2, CAD and DOS.

"Best of all, my PC now runs much faster in Windows, DOS and games. I almost never see that Windows hour-glass. GRAPHICS XPRESSION. At only $299, it is still great advice."

"I got the advice I needed."

GRAPHICS XPRESSION™

- **Affordable 64-bit Accelerator**
- **Fast 37M Winmarks (4.0)**
- **Best Price / Performance Value**
- **Instant Windows Mode Switching**

NOW SHIPPING!

WINDOWS PERFORMANCE - WINBENCH 4.0*

Outperforms other accelerators in Windows and DOS

- Resolutions up to 1280x1024 non-interlaced
- Full acceleration in 256 to 16.7M colors
- Comes with enhanced driver support for Windows, OS/2 PM, Windows NT, CAD and DOS
- Up to 75Hz refresh rate
- Available for ISA, PCI or VESA Local Bus
- 2MB DRAM memory
- Five year limited warranty
- Priced at only **$299****

64-bit Accelerator

Perfecting the PC

ATI TECHNOLOGIES INC.
33 Commerce Valley Drive East
Thornhill, Ontario Canada L3T 7N6
Telephone: (905) 882-2600 ext. 4551
Facsimile: (905) 882-2620
CompuServe: GO ATITECH
76004,3656

Copyright © 1994 ATI Technologies Inc. ATI, GRAPHICS XPRESSION, WinSwitch, FlexDesk+, and *mach64* are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. Features and specifications are subject to change without notice. Product may not be exactly as shown. Available colors dependent upon resolution mode. Features shown for Windows versions.* Performance levels may vary for other operating systems. Winbench 4.0 done on 2MB PCI graphics cards at 1024x768 in 256 colors at 70Hz with 100MHz Pentium, 16MB memory, 420MB hard disk. ** Suggested US retail prices, dealers may sell for less.

Circle 5 on reader service card

Win a Zeos Pantera 66

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Zeos Pantera 66, a Best Buy Pentium-66 featured in this month's PC World Top 20.

HOW TO ENTER: Fax your completed questionnaire to *PC World* at 415/974-7367. If you have trouble connecting to this number, fax your survey to 415/974-7404 or 415/442-1891. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 9-SS, *PC World,* 501 Second St. #600, San Francisco, CA 94107-1496. Send your survey in no later than September 30.

HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES! One entry per person per month. Void where prohibited by law.

LAST, FIRST NAME

FAX NUMBER

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

- ○ Acer
- ○ Acma
- ○ ALR
- ○ Ambra
- ○ Aquiline
- ○ Ares
- ○ AST
- ○ ATronics
- ○ AT&T (NCR)
- ○ Austin
- ○ Axik
- ○ Blackship
- ○ CAF
- ○ Canon
- ○ Compaq
- ○ CompuAdd
- ○ Compudyne
- ○ Comtrade
- ○ DEC
- ○ Dell
- ○ Diamond
- ○ DTK
- ○ Dual
- ○ Eltech
- ○ Epson
- ○ Ergo
- ○ Everex
- ○ Gateway 2000
- ○ Hertz
- ○ Hewlett-Packard
- ○ Hyundai
- ○ IBM
- ○ Inmac
- ○ Insight
- ○ Intelligent
- ○ Leading Edge
- ○ Micro Express
- ○ Micron
- ○ Microsource
- ○ Midwest Micro
- ○ MIS
- ○ Mitac
- ○ National Micro
- ○ NEC
- ○ Netis
- ○ Northgate
- ○ Packard Bell
- ○ Panasonic
- ○ PC Brand
- ○ Pionex
- ○ Polywell
- ○ Quantex
- ○ Samsung
- ○ Other (specify first 7 letters)
- ○ Sharp
- ○ Shasta
- ○ Swan
- ○ Tagram
- ○ Tandy
- ○ Tangent
- ○ Texas Instruments
- ○ Toshiba
- ○ Tri-Star
- ○ USA Flex
- ○ VTech (Expotech, Laser)
- ○ Winbook
- ○ Zenith (ZDS)
- ○ Zeos
- ○ No-name clone

Is this PC a...?

- ○ Desktop
- ○ Notebook/laptop
- ○ Hand-held

Is the CPU a...?

- ○ Pentium
- ○ 80486
- ○ 80386
- ○ 80286
- ○ Other (specify): _____

Where did you buy this PC?

- ○ Local dealer
- ○ Mail/phone order
- ○ Direct from field sales force
- ○ Membership discount store
- ○ Computer superstore
- ○ Home/electronics store
- ○ Retail store
- ○ VAR
- ○ Other (specify): _____

When did you buy this PC?

- ○ This month
- ○ 1–3 months ago
- ○ 4–6 months ago
- ○ 7–12 months ago
- ○ More than 12 months ago
- ○ Not sure

Would you buy this brand of PC again?

- ○ Yes
- ○ No

If you bought your PC by mail or phone, how long after you ordered it did it arrive?

○ Less than 1 week ○ 1–2 weeks ○ 3–4 weeks ○ More than 4 weeks

WHAT ARE YOU REPORTING? (Check only one.)

- ○ No problems ever
- ○ No problems since last responded to survey
- ○ A problem since last responded to survey
- ○ An older problem not previously reported in survey

If you're NOT reporting a problem, please fill out the Uptime Report (below).

To REPORT a problem, fill out the Problem Report (right column).

UPTIME REPORT

How many consecutive months has your PC been trouble-free?

○ 3 months ○ 6 months ○ 9 months ○ 12 months ○ 15 months ○ 18 months ○ More than 18 months

■ STOP HERE if you're not reporting a problem.

PROBLEM REPORT

When you first received your NEW PC, was any component "dead on arrival"?

○ Yes ○ No ○ Don't know

If so, which one was it? (Check all that apply.)

- ○ Battery
- ○ CD ROM
- ○ CPU
- ○ Floppy drive
- ○ Graphics/video board
- ○ Hard drive
- ○ Keyboard
- ○ Memory
- ○ Modem/fax board
- ○ Monitor/screen
- ○ Motherboard
- ○ Mouse
- ○ Power supply
- ○ Sound board
- ○ Other

■ For the following questions, describe your most recent HARDWARE-related problem with this PC.

Did you contact the manufacturer for repair service or technical support?

- ○ Yes
- ○ No
- ○ Not sure

What was this problem finally identified as?

- ○ Faulty component
- ○ Incorrectly installed software
- ○ Wrong configuration
- ○ Faulty peripheral
- ○ Device conflicts
- ○ OS problem
- ○ Other
- ○ Don't know

If a component failed, which one was it? (Check all that apply.)

- ○ Battery
- ○ CD ROM
- ○ CPU
- ○ Floppy drive
- ○ Graphics/video board
- ○ Hard drive
- ○ Keyboard
- ○ Memory
- ○ Modem/fax board
- ○ Monitor/screen
- ○ Motherboard
- ○ Mouse
- ○ Power supply
- ○ Sound board
- ○ Other

How many times have you had a problem with this PC?

- ○ This was first time
- ○ Two
- ○ Three
- ○ Four
- ○ More than four

Did the problem occur under warranty?

- ○ Yes
- ○ No
- ○ Not sure

How recently did this problem occur?

- ○ This month
- ○ 1–3 months ago
- ○ 4–6 months ago
- ○ 7–12 months ago
- ○ More than 12 months ago
- ○ Not sure

How long after PURCHASE did this problem occur?

- ○ Less than 1 month
- ○ 1–3 months
- ○ 4–6 months
- ○ 7–12 months
- ○ More than 12 months
- ○ Not sure

■ For the following questions, describe your most recent SERVICE or SUPPORT experience.

What type of service/support did you receive?

- ○ Phone
- ○ On-site
- ○ In-store help
- ○ Express system swap
- ○ Express component swap
- ○ Factory return

If phone service, how long were you on hold?

- ○ Not at all
- ○ Less than 1 min.
- ○ 1–2 min.
- ○ 2–5 min.
- ○ 5–10 min.
- ○ 10–20 min.
- ○ More than 20 min.

How long did it take before you talked to the person who finally helped you?

- ○ Less than 1 hour
- ○ 1–24 hours
- ○ 1–2 days
- ○ 3–5 days
- ○ 1 week
- ○ More than 1 week

How long did it take to resolve the problem completely?

- ○ Less than 1 week
- ○ 1–2 weeks
- ○ 3–4 weeks
- ○ More than 1 month
- ○ Never resolved

Was the problem resolved to your satisfaction?

○ Yes ○ No

Based on the service and support you received, would you buy this brand of PC again?

○ Yes ○ No

On the whole, how satisfied were you with the service and support you received?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Not at all — Satisfied — Extremely satisfied

How likely is it that you would recommend this brand of PC to a friend or colleague?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Not at all — Likely — Extremely likely

PLEASE FAX TO 415/974-7367

GET WHAT YOU WANT!

with an ACMA custom desktop system

DON'T SETTLE FOR A SYSTEM YOU AREN'T GOING TO BE HAPPY WITH IN 3 MONTHS! PLANNING TO BUY A DX2-66, BUT REALLY WANT A PENTIUM? WOULDN'T YOU REALLY PREFER A 15" MONITOR AND A 400MB HARD DRIVE? GET WHAT YOU WANT AND GET AN ACMA DESKTOP SYSTEM. YOU'LL GET A GREAT PRICE AND THE FEATURES YOU WANT...PLUS THE SECURITY YOU NEED WHEN BUYING A COMPUTER.

- 6 PC WORLD BEST BUY AWARDS
- 45-DAY MONEY BACK GUARANTEE
- 1 YEAR PARTS AND LABOR WARRANTY
- 1 YEAR ON-SITE SERVICE*
- 5-STAGE TESTING & QUALITY CONTROL PROCEDURES
- NAME BRAND COMPONENTS

** Within approved service areas. Call for details on guarantee, warranty and service policies.*

PC WORLD — June 1994, May 1994

PC WORLD BEST BUY — June 1993, February 1993, October 1992, November 1992

All ACMA systems listed below come with a 210MB hard drive, 3.5" floppy drive, 14" Non-interlaced SVGA monitor, MS-DOS 6.21, MS-Windows for Workgroups, mouse, 101 enhanced keyboard, ACMA mousepad and more! Call for details.

ACMA PENTIUM™ BASED SYSTEMS

- ✓ Full Tower case
- ✓ 8MB of RAM
- ✓ PCI Local Bus HD controller
- ✓ Diamond Stealth PCI Local Bus Video Card

60MHz	66MHz	90MHz
$2195	$2295	$2595

ACMA 486 SYSTEMS

- ✓ 4MB of RAM & 256K cache
- ✓ Desktop or mini tower case
- ✓ VESA local bus IDE controller
- ✓ VESA local bus Video Card with 1MB

SX/33	DX/33	DX2/66
$1195	$1395	$1495

CALL FOR DX4 PRICING

ACMA MULTIMEDIA SYSTEMS

- ✓ Multimedia case with built-in speakers and 15 watt amplifier
- ✓ Dual Speed CD-ROM drive
- ✓ 16-bit Sound Card & 4 CD Titles!

SX/33	DX/33	DX2/66
$1495	$1695	$1795

PCW INFO HOTLINE: INSTANT FAX BACK
1-800-234-0455 ext. 118

800-786-6888
ext. 894

(510) 623-1212 FAX:(510)623-0818

CALL FOR SPECIAL GSA PRICING

intel inside®

COMPUTERS, INC.®
Acma

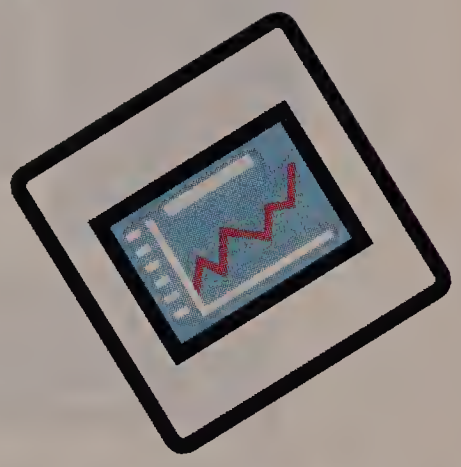
47988 Fremont Blvd. Fremont, CA 94538

Prices and specifications subject to change without notice. The Intel Inside logo is a registered trademark of Intel Corporation.

VISA MasterCard DISCOVER

Circle 66 on reader service card

A new generation of graphics accelerators promises to kick-start Windows, multimedia, and video. We review 33 boards priced from $135 to $599.



SPEED DEMONS

Top Windows Accelerators

Let's face it, Windows is a dog—and not a well-behaved one at that. It sheds megabytes of files onto your hard disk and gobbles up as much RAM as you throw its way. Worst of all, it needs constant attention from your CPU for even the most basic graphics tasks, slowing a fast 486 to a crawl when displaying images, formatting text, and closing application windows. With everything from graphical spreadsheets and word processors to CD ROM–based multimedia titles making greater demands on your system, Windows is definitely a dog in need of a few new tricks.

Now a new generation of graphics accelerators promises to put some sizzle back in your Windows. How? The accelerators take the load off your CPU when you do processor-intensive tasks, such as scrolling through font-filled documents or moving graphic objects across the screen. Best of all, these boards offer better performance than ever, thanks to new hardware technology that opens the pipes for Windows graphics.

If you do a lot of basic Windows work, like word processing and E-mail, a variety of boards costing less than $200 can put some zip back in your system. Real Windows junkies—those who go further afield into graphical spreadsheets, desktop publishing, and image editing software—will find impressive power for less than $300 on the street. And for the hard-core graphics hounds—engineers using computer-aided design (CAD) programs and designers working with 24-bit image editors and page layout programs—the new high-end boards boast unprecedented performance.

To help you determine which graphics accelerator is right for your system, we've tested 33 boards using our application-based graphics benchmark—the *PC World* Windows Integrated Test Suite. Developed in conjunc-

By Michael Desmond and Fred Dunn

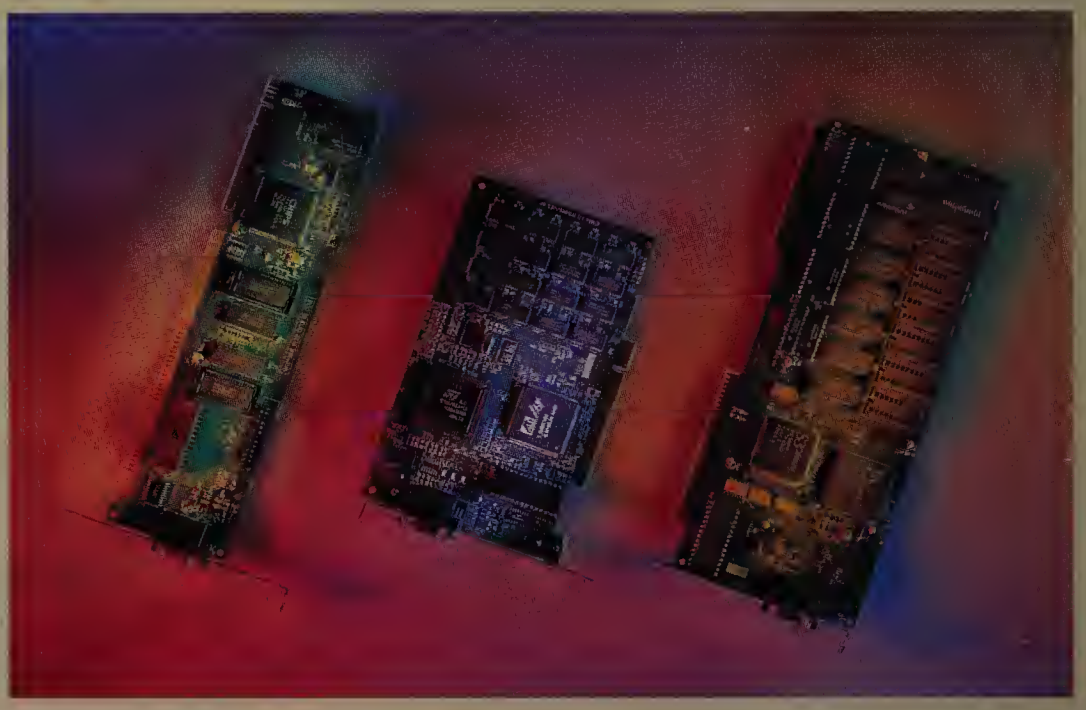
LOUIS FISHAUF

tion with Jon Peddie Associates, WITS performs real-world tasks using popular Windows applications to reveal the effect these boards have on system-level performance. We installed the boards in a 66-MHz 486DX2 system and ran them under Word 2.0 for Windows, Excel 4.0 for Windows, CorelDraw 3.0, PhotoStyler 1.1, QuarkXPress 3.11, and Freelance Graphics 2.01. Each board's total WITS score lets you compare overall performance, while the application scores let you see which boards work best in the types of programs you use most. Since our March issue, we've used WITS scores to create our ongoing list of the Top 10 graphics boards, which is updated monthly.

But performance isn't everything. Convenience and ergonomic features like simple installation, graphics tools, and easy-on-the-eyes refresh rates can save you plenty of time and aggravation. Some of these boards go further still, adding enhanced video playback that smooths and expands tiny video windows, turning your system into a multimedia powerhouse.

Best Buys

At the low end, the overachieving Boca Voyager runs away with the prize. Its features are competitive with those of its price peers, yet it performs on a par with boards costing $100 to $200 more. For mainstream users, we recommend the ATI Graphics Xpression, which soundly bested its midrange peers and even some expensive VRAM competition. With strong software, good documentation, and built-in enhanced video playback, the Graphics Xpression leapt past the Diamond Stealth 32. For professionals, the Diamond Stealth 64 edges out the Number Nine #9GXE64 Pro and the ATI Graphics Pro Turbo, thanks to its balance of speed, features, and low street price.



BEST BUYS Boca Voyager, ATI Graphics Xpression, and Diamond Stealth 64.

The New Hardware

At the heart of every graphics board is the graphics coprocessor. So when chip makers like ATI, Cirrus Logic, Matrox, S3, Tseng Labs, and Weitek introduced new graphics chips, the performance of accelerator boards jumped. Many of the boards reviewed here use a wide 64-bit path for moving graphics data; the last time we reviewed these products ("Turbocharging Windows," October 1993), only the $599 Matrox MGA Ultima VL board boasted a 64-bit design. Others employ a technique called interleaving to boost performance of 32-bit chips. Whatever the means, these boards continue to excel at taking over common Windows operations—drawing lines, scrolling text, applying colors to shapes, and moving icons and graphics—so that the system's CPU can spend more time with other tasks. The net results are faster screen redraws and better system performance.

But improved performance costs money. To achieve their speed, all the 64-bit and 32-bit interleaved boards need 2MB of memory—twice what was standard a year ago. As a result, many mainstream boards run at least $200 on the street.

Aside from speed, what will that extra megabyte get you? All but four of the 2MB boards can display 24-bit color (16.8 million colors) at 800-by-600-pixel resolution and 16-bit color (65,000 colors) at 1024 by 768 resolution. That means that everything from image editing programs to multimedia titles can benefit from the more realistic display of photos and images the extra memory offers. By contrast, 1MB boards are limited to 24-bit color operation at 640 by 480 resolution and can't match the speed of their 2MB counterparts.

But there's more to memory than just quantity. Graphics boards use two different types of memory—dynamic RAM (DRAM) and video RAM (VRAM)—that determine capabilities such as performance and refresh rates. The DRAM on a graphics card is essentially the same as the RAM used in your system. It's plentiful and relatively cheap, but it suffers when handling graphics tasks because it has only one port for accepting and releasing data. In intensive operations, DRAM must delay redraws of graphics while it releases data to refresh the screen. High-end boards use the pricier VRAM; it has two ports, so it can accept data from the graphics coprocessor while simultaneously refreshing the screen. Because of this, VRAM boards can more easily deliver very high resolutions and refresh rates, which are vital for professional design, CAD, and document imaging applications.

Finally, we come to the bus question. If you're upgrading, there's really no question at all, since ISA machines take ISA boards, VL machines take VL, and so on. But if you're looking at a new system—and trying to choose between VL and PCI, for example—our testing of identical ISA, VL, and PCI boards shows that PCI models enjoy a slight performance advantage over VL boards. While individual performance varied, PCI boards turned in about a 5 percent lead in system-level performance over VL boards when tested at 1024 by 768 resolution, with a 72-Hz noninterlaced refresh rate, and using 256 colors. ISA trailed VL performance by about 10 percent. The margins varied by application—in our test suite, Freelance and Excel scores varied the most among the different buses. Keep in

mind that higher resolutions and greater color depths increase the data load, causing ISA and VL to lag further behind PCI.

Right Before Your Eyes

All the talk about performance can obscure a key issue: ergonomics. As people spend more time in front of PCs, working with larger 15-inch and 17-inch monitors, the problems associated with screen flicker—fatigue, eyestrain, and headaches—can become more severe. Graphics boards determine the monitor's vertical refresh rate, which is the number of times per second the monitor's electron gun repaints the screen.

The Video Electronics Standards Association (VESA), an organization that sets industry standards, recommends a 72-Hz refresh rate (72 repaints per second) at 1024 by 768 resolution, because it makes the display appear stable to most people (though some may perceive flicker at rates as high as 90 Hz). At rates below 70 Hz, many users notice screen flicker—particularly on bright, white backgrounds. In general, people working with larger monitors—17 inches and above—and those who work long hours in front of a display should seek boards offering high refresh rates. While all the graphics boards we examined in this review handle at least 70-Hz refresh at 1024 by 768 resolution, some go as high as 126 Hz. But remember, your graphics board can do only as much as your monitor lets it: An older 14-inch VGA monitor will simply be incapable of handling 1024 by 768 resolution and 90-Hz refresh. So do yourself a favor—make sure that your hardware is up to snuff before committing to a board.

Not Just Stupid Pet Tricks

Many of the new boards provide sophisticated features. Most products reviewed include Windows-based utilities for point-and-click changes to resolution, color depth, and refresh rate; others offer more sophisticated software. Virtual display utilities store a picture of elements not visible on the screen in board memory, letting you quickly pan over to another spreadsheet or open application. Other features, such as keyboard controls to position and size the monitor's display, assignable hot keys for enabling graphics functions, and point-and-click zooming, can be especially useful for switching among various apps and screen resolutions.

Some graphics boards cross the line into video by adding hardware enhancement of full-motion video playback. All ATI boards include hardware for expanding video windows and smoothing pix-

TOP 10 Windows Accelerators

New this month
Up from last month
No change from last month
Down from last month

		Overall value	Estimated street price	Windows Integrated Test Suite scores: Word 2.0 for Windows	Excel 4.0 for Windows	CorelDraw 3.0	PhotoStyler 1.1	QuarkXPress 3.11	Freelance Graphics 2.01	Bus type	RAM (MB/type)[1]	Chip/ driver date	Reader service number
1	ATI Graphics Xpression 905/882-2600	93	$250	13.4	16.6	13.2	11.6	15.6	4.8	PCI	2 / D	88000CX 4/11/94	684
2	Diamond Stealth 32 800/380-0030	91	$249	13.6	15.5	13.3	11.5	12.2	6	PCI	2 / D	ET4000/W32p 12/29/93	685
3	Diamond Stealth 64 800/380-0030	90	$315	13.3 13.5	17.6 17.9	13.9 13.1	11.8 11.2	13.3 12.9	7.6 8.5	PCI VL	2 / V	Vision964 4/1/94	696
4	Boca Voyager 407/997-6227	90	$145	12.6	13.8	12.8	11.6	14.1	4.6	VL	1 / D	F64300 3/22/94	678
5	Number Nine #9GXE64 Pro 800/438-6463	89	$356	13.7	16.8	12.9	11.9	15.6	8	PCI	2 / V	Vision964 4/26/94	700
6	STB LightSpeed 800/234-4334	89	$259	12.5	14.5	12.6	11.4	14.7	5.9	VL	2 / D	ET4000/W32p 4/10/94	692
7	ATI Graphics Pro Turbo 905/882-2600	88	$380	13.6	17.9	13.6	11.6	16.2	6.7	PCI	2 / V	88000GX 4/11/94	694
8	Number Nine #9GXE64 800/438-6463	88	$275	12.8	14.7	10.3	11.5	14.3	6.5	PCI	2 / D	Vision864 4/26/94	690
9	STB Nitro 800/234-4334	87	$219	12.2	13.4	13.1	12.6	14.7	4.1	PCI	2 / D	GD5434 2/18/94	693
10	Hercules Dynamite Power VL 800/532-0600	86	$237	12.7	14.2	12.8	11.3	14.4	5.5	VL	2 / D	ET4000/W32p 12/1/93	687

Methodology Boards were tested on a 486DX2-66 system with 16MB of RAM and 256K of secondary cache. Application scores are the factor by which a board exceeds our baseline system, an unaccelerated ET4000-based VGA adapter on a 386DX-25 with 16MB of RAM. The overall value score combines ratings of overall performance, estimated street price, and product features. For all scores, higher is better.

[1] D = DRAM, V = VRAM.

For more information about all products in this table, circle reader service no. 903.

els. The VideoLogic 928Movie goes even further, putting a graphics accelerator chip, a video playback chip, and 16-bit sound capability on a single board. While the 928Movie is unique among products in this roundup, many of the boards will offer video-ready configurations by year-end (see "The Next Step: Full-Motion Video").

In keeping with the "green" movement, all but six of these boards comply with VESA's energy-saving power-down standard, known as the Display Power Management Specification (DPMS). Several boards meeting the DPMS standard include Windows utilities that let you set an interval of inactivity before the board tells the monitor to enter sleep mode. Just be sure your monitor is DPMS ready, since you risk damaging it if your graphics board supports DPMS and your monitor does not.

Driven to Distraction

If you're wondering how similar boards can offer such a wide range of performance and features, look no further than the software that controls them. Graphics boards use highly optimized software programs called *drivers* to handle all communication between your system and the board. Drivers manage resolutions and colors and tell Windows which tasks to dump to the graphics chip.

In general, the better the driver, the better the board. Though chip manufacturers write their own drivers, many board vendors fine-tune them to squeeze out more performance. For example, the STB LightSpeed, based on Tseng Labs' popular ET4000/W32p chip, was a shoo-in for second place in the midrange performance rankings. But its STB-customized driver conflicted with our Freelance test, which kept the board from finishing the test. When STB provided a fixed version of the driver, which the company did not have an opportunity to fine-tune, the board's performance fell to third, behind that of the Diamond Stealth 32. No doubt future versions of the STB board's driver will improve its performance. But poor drivers can result in slow performance, minor glitches, and even system crashes. A bad driver can ruin your whole day.

How can you tell if a vendor has solid, stable drivers for its boards? Get online and ask. Go to the graphics forums of CompuServe, America Online, and other services and solicit users' experiences with these products. You're likely to see some patterns emerge. Also, keep in mind that larger companies generally have more resources to commit to writing and maintaining drivers, and almost all board vendors release new drivers on a quarterly basis—some even do so weekly or, it seems, daily—to tweak performance, fix bugs, and address hardware and software updates. So chances are, by the time you buy a new graphics board, the drivers inside the shrink-wrap are already one or two revisions old. Our advice: Before you even install the board, log on to the vendor's BBS or online forum and download the latest drivers. If you don't have a modem, you can usually have the vendor send you a free set of update disks.

In general, the better the driver, the better the board. Though chip manufacturers write their own drivers, many board vendors fine-tune them to squeeze out better performance.

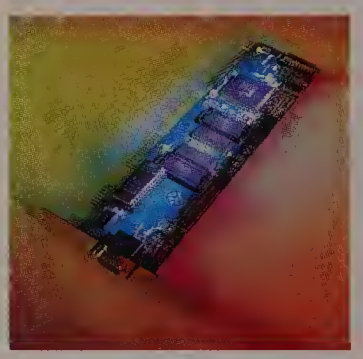
What's Best for You?

We reviewed 33 boards with street prices under $600, breaking them into three groups that address the needs of various Windows users. For less demanding users, we tested 5 boards with street prices under $200. Mainstream business users should check the 14 boards in our roundup that cost between $200 and $300 and use inexpensive DRAM. Finally, anyone working with high-resolution, 24-bit color should look at the 14 high-end boards, which rely on fast VRAM and generally cost more than $300 on the street.

Because each group of boards addresses a different need, we picked Best Buys from each of the three groups. We also added the data from this review to our ongoing Top 10 list of graphics boards, updating previously reviewed products and adding new ones to the list. The Top 10 chart represents our picks of the best all-around boards, as opposed to more specific judging within each group.

Under $200

Put Some Fire Under Your Text



Best Buy

Boca Voyager (VLB)

Not everyone needs an expensive graphics board. If you do basic Windows word processing and other text-based tasks, any of the DRAM-based 1MB boards in this group will pack enough punch to speed 256-color displays running at 800 by 600 resolution. But when it comes to performance, the low-end winner is the $145 Boca Voyager, hands down. It's the best all-around board in this price range, offering outstanding performance, good software, and the lowest price of any board that has broken into our Top 10.

Based on Chips and Technologies' F64300 chip, the Voyager uses a 256K cache to handle most screen refresh duties, freeing its 1MB of DRAM (expandable to 2MB) for updating graphics data. Not only did the Voyager soundly beat its competition with an overall WITS score of 69.42, its biggest leads came in mainline business apps—Excel, WinWord, and Freelance. For business users working with no more than 256 colors, the Voyager is an excellent option.

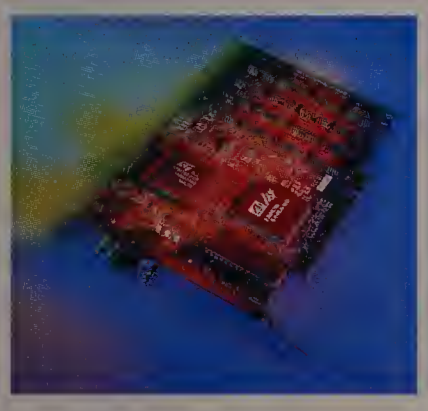
Well behind the Voyager came the STB Express PCI, with a WITS score of 62.41. Based on Avance Logic's ALG2301 accelerator chip, the $139 Express PCI performed ably under CorelDraw and PhotoStyler but posted a Freelance score of just 1.9, among the worst we've seen. Western Digital's $139 Paradise VL Plus followed with a WITS score of 60.42. The VL Plus tended to lag in business-related applications. Miro Computer Products' miroCrystal 10SD and Elsa Computer's Elsa Winner 100VL, both based on S3's aging 86C805 chip, simply could not keep pace.

These products also vary in sophistication. While the Boca Voyager's Windows-based installation was simple and intuitive, the routine for selecting a monitor and refresh rate demanded some trial and error. This is not an uncommon problem: Many of these boards left us guessing when it came to selecting monitors and display set-

tings. Both the Paradise VL Plus and the STB Express PCI offered basic installation routines, with Windows-based software for changing resolutions and other settings. And while the miroCrystal 10SD intrigued us with its power-saving DPMS capability, color tint controls, and uninstall feature, we found its toggle switches for setting refresh rates an unacceptable nuisance, particularly since most boards handle refresh setting in software.

$200 to $300

Mainstream Boards for Almost Any Task



Best Buy

ATI Graphics Xpression (PCI)

Honorable Mention: Diamond Stealth 32 (PCI and VLB)

What if your computing demands are more eclectic than basic word processing or E-mail? Graphical spreadsheets, low-end CAD, and affordable paint programs (including those embedded in word processors and spreadsheets) are raising the graphics bar. Fortunately, for less than $300, users can find boards that deliver high-resolution color, fast refresh rates, and outstanding performance.

All boards in this midrange category use inexpensive DRAM to store graphics data but feature wider data paths to boost performance. Seven of the 14 midrange products we tested employ true 64-bit designs using chips from S3, Cirrus Logic, and ATI. The remaining seven boards rely on 32-bit interleaving—using Tseng Labs' ET4000/W32i and W32p chips—to boost graphics performance by timing accesses to the board's RAM. This scheme lets the boards pour more data down the same pipes.

Our overall pick in this pack is the PCI-based ATI Graphics Xpression. With software tools second only to the Number Nine #9GXE64's, and an aggressive $250 street price, the Graphics Xpression roared to the top with the best DRAM-based WITS performance we've ever seen. The Graphics Xpression scores in our Top 10 as well, seizing the number one spot from the incumbent—the Diamond Stealth 32 PCI—with an unprecedented value score of 93. The Diamond Stealth 32 still earns mention with its potent combination of performance, software, and price.

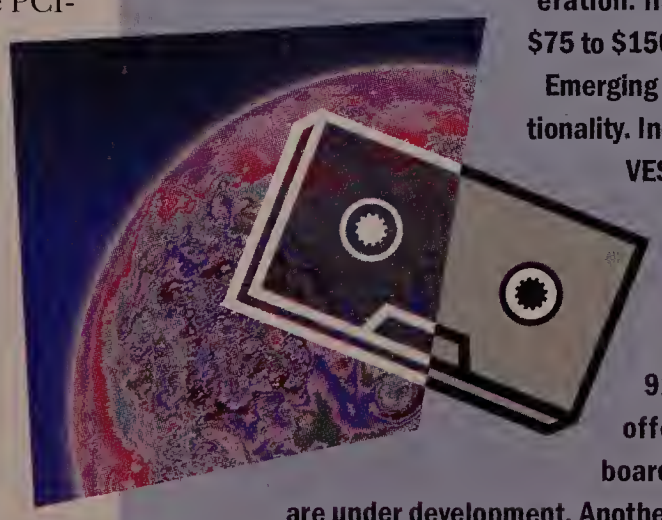
When it comes to pure performance, the ATI Graphics Xpression PCI board towers above its midrange competition with a WITS score of 75.07. This board posted the best graphics-oriented score (from CorelDraw, PhotoStyler, and QuarkXPress) and the second best business-oriented score (from WinWord, Excel, and Freelance) in the midrange group and even outran leading VRAM boards such as the Diamond Viper Pro and Matrox MGA Ultima. The other standout was the Diamond Stealth 32 PCI, with a WITS score of 72.23 and the highest overall business-application score of any board in this range. Those with VL systems should consider the Diamond Stealth 32 VL, the STB LightSpeed, or the Hercules Dynamite Power VL, all of which have WITS scores above or near 70 (the Stealth 32 VL scored 69.49).

While most boards fell within 10 percent of the ATI Graphics Xpression in performance, the Hercules Dynamite Pro ISA, Actix GraphicsEngine 64, and miroCrystal 20SD fell just behind the rest. The Dynamite Pro ISA, based on Tseng Labs' W32i chip, no doubt fell victim to its slow bus, but the subpar performance of the Actix and Miro boards (both based on S3's Vision864 chip) is probably the result of unoptimized driver software.

With sufficient performance almost assured, what's to set these boards apart? In a word: features. A foolproof installation routine, intuitive display controls, and useful software (such as pan and zoom capability) can easily save more time than a slightly speedier board. And don't overlook fast refresh rates. If you want to run much higher than 72 Hz at 1024 by 768, check out the PCI- and

The Next Step: Full-Motion Video

Graphics board vendors aren't caught in freeze-frame: Over the next six months, they will embrace full-motion video, offering affordable, enhanced video playback and capture as an installed feature or upgrade on many of their graphics cards. The same companies that build the graphics accelerator chips are creating the video hardware. S3, Weitek, Tseng Labs, and others are touting their chip designs as affordable, ready-made remedies to jerky, postage stamp–size video display. Boards using these chips will be able to expand video to full screen and handle complex color conversions without compromising CPU performance. Best of all, most of these designs are modular, so users can buy a graphics-only board with an open socket and later plug in a chip to add video acceleration. In general, expect video-capable boards to run $75 to $150 more than their graphics-only counterparts.



Emerging standards also promise to add power and functionality. Industry standard maker VESA has developed the VESA Media Channel (VMC), which enables up to 15 simultaneous data sources to connect into a graphics system—a boon for multipoint desktop teleconferencing and complex multimedia presentations. While the VideoLogic 928Movie is the only board in this review to offer VMC capability, VMC-compliant graphics boards, video capture cards, and other peripherals are under development. Another standard, called the VESA Advanced Feature Connector (VAFC), improves on the current 8-bit, 8-MHz feature connector that's now found on most cards by widening the data path and boosting speed.

VL-based Genoa Phantom 32i and the PCI-based miroCrystal 20SD, which offer refresh rates in excess of 80 Hz.

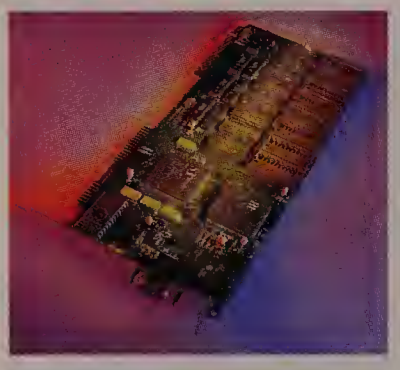
At the top of the feature heap is the PCI-based #9GXE64 from Number Nine Computer; this board includes the best suite of software we've seen. Its virtual desktop tools let you work with multiple applications and screens, its zoom capability offers detailed views of images, and its programmable hot keys provide useful shortcuts for adjusting the display. Installation was a piece of cake. The #9GXE64 is street priced at $275.

Not far behind are the PCI and VL versions of the Diamond Stealth 32 and the PCI-based ATI Graphics Xpression, which offer sensible installations, handy graphics tools, and excellent documentation. Finally, the PCI and VL versions of the Orchid Kelvin 64 earn special mention for their network-aware installation routine.

The mainstream boards were easy to install and came with useful software, though some products were rough around the edges. The Actix GraphicsEngine 64's installation suffered from annoying bugs, and the documentation could use proofreading. While several boards include jumpers and switches, their use is limited to rare adjustments such as disabling VGA capability or changing an IRQ.

Over $300

VRAM Boards Boast Speed and More



Best Buy

Diamond Stealth 64 (PCI and VL)

Honorable Mentions: Number Nine #9GXE64 Pro (PCI), ATI Graphics Pro Turbo (PCI and VL)

For all the performance and features offered by midrange boards, those who rely on 24-bit color graphics need more—the better performance, higher resolutions, greater color depths, and faster refresh rates of high-end boards. We reviewed 14 boards that cost more than $300 on the street and use fast, dual-ported VRAM to ensure a steady flow of graphics data to your screen. One exception: The $290 ATI Graphics Ultra Pro is included here because it's a VRAM card and has been one of the most popular high-end boards over the last two years.

Eight of these products use 64-bit accelerator chips to eliminate performance-sapping bottlenecks. The Number Nine #9GXE64 Pro and Diamond Stealth 64 boards use S3's Vision964 chip, while the ATI Graphics Pro Turbo and Matrox MGA Ultima boards rely on their own 64-bit coprocessors. While we saw some new 32-bit chips—such as the interleaved Weitek P9100 found on the Diamond Viper Pro, and the IIT AGX-016 found on the Hercules Graphite Power VL and VidTech GraphMax L12—they failed to deliver performance on a par with their 64-bit competition.

Our high-end Best Buy is the Diamond Stealth 64, thanks to its low price, fast performance, and strong software. In our test suite, the PCI and VL versions of the Stealth 64 offered nearly identical performance. While both the ATI Graphics Pro Turbo and Number Nine #9GXE64 Pro posted slightly better numbers in the speed category, neither could match the $315 Stealth 64 in overall value. After the ATI Graphics Ultra Pro, it's the least expensive board in this group, and it's the highest-ranked VRAM board in our Top 10, slipping into third place just behind the Diamond Stealth 32 PCI.

The $380 ATI Graphics Pro Turbo, meanwhile, is *the* fastest board we've ever seen. How fast? The PCI version blazed through our WITS test with a remarkable 79.65 score. It clocked the fastest Excel and QuarkXPress times in the review and enjoyed the best graphics-oriented performance of any board we tested. (The VL version of the ATI Graphics Pro Turbo fell about 4 percent behind its PCI twin, for a WITS score of 76.6; its performance in business applications lagged about 7 percent.)

The ATI Graphics Pro Turbo blazed through our tests. It's the fastest board we've ever seen.

Hot on the ATI board's heels, the Number Nine #9GXE64 Pro posted an overall WITS score of 78.78. Street priced at $356, the #9GXE64 Pro is a surprisingly versatile performer, finishing in a second-place tie in business-oriented performance and third in graphics. A top PhotoStyler and third-place QuarkXPress finish make it a good choice for desktop publishers. The Diamond Stealth 64 PCI and VL settled in behind the #9GXE64 Pro with WITS scores of 77.34 and 77.05, respectively. One interesting note: The VL version of the Stealth 64 outperformed its PCI counterpart in mainline business applications.

There were also some losers among the high-end boards. The aging ATI Graphics Ultra Pro boards both suffered in performance; the VL version fell about 20 percent behind the leader, while the ISA version fell about 30 percent. The poor showing of the Graphics Ultra Pro boards—which even lagged behind almost all the midrange boards—is an indication of how much graphics accelerator performance has improved. Just ahead of the ATI boards were the $340 Hercules Graphite Power VL, the $320 VidTech GraphMax L12, and the $500 Matrox MGA Ultima ISA—all of which lagged about 15 percent or more behind the leader.

These boards need to deliver high refresh rates and competitive tools for tasks such as image editing and CAD. Leading the group here is the Number Nine #9GXE64 Pro, with comprehensive display utilities, top-notch documentation, and smooth installation. ATI boards also grabbed our attention with their Windows-based FlexDesk controls and enhancement of full-motion video playback, while Diamond's InControl Tools were powerful as well. Matrox boards, meanwhile, offer an enhanced 8-bit color mode that produces 24-bit–like images, even at 1280 by 1024 resolution. This mode slows performance, but it lets users display high-quality images with just 2MB of VRAM.

If you need the highest refresh rates, consider the ATI Graphics Pro Turbo, Diamond Stealth 64, Diamond Viper Pro, or Number Nine #9GXE64 Pro. All these boards offer at least 100-Hz refresh at 1024 by 768 resolution. The ISA version of the Matrox MGA Ultima also boasts a refresh rate over 100 Hz, though other versions do not. Other boards in this group deliver at least 75 Hz at 1024 by 768.

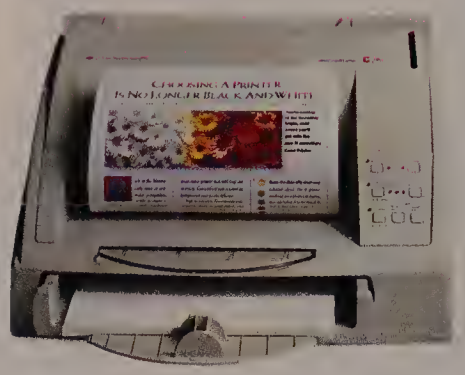
Fred Duuu is a principal officer of Jou Peddie Associates, a cousulting firm specializing iu PC graphics techuology. Michael Desmoud is au assistaut editor for PC World.

Not everything in
Texas comes easy.
But some things do...

Printers from Texas Instruments. Right out of the box, they're easy.

NEW
12 ppm

Optional multi-network interface now available.



microMarc™ Color Printer
Under $400.

The easy way to brighten up your documents. This ***flexible color/black and white inkjet printer*** adds vivid color to your work and brings newsletters, proposals and even schoolwork to life. Windows™/DOS compatible at a price that's easy to handle.

microWriter™ PS23 Printer
Under $750.

An ***entry-level, laser-quality printer*** for small businesses and home users. 300 dpi, 5 pages per minute, 23 scalable fonts, Mac™/Windows/DOS compatible.

microLaser™ Pro 600 Printer
Under $1,350.*

The easy solution for users looking for a ***feature packed, high performance 600 dpi printer.*** It comes standard with a printing speed of 8 pages per minute, 6 MB memory, two 250 sheet paper trays. Mac/Windows/DOS compatible.

microLaser PowerPro Printer
Under $1,750.

Easily one of the fastest 600 dpi printers for the price, and ***ideal for heavy graphics printing.*** Start with the Pro 600 and add a blazing 12 pages per minute, a turbo charged processor, and more scalable fonts. Mac/Windows/DOS compatible.

microLaser Pro 600 is winner of these fine awards.

3/21/94

microWriter is winner of these fine awards.

Adobe PostScript

Standard on microLaser PRO 600, microLaser PowerPro, microWriter PS23.

All prices are estimated street prices. Dealer prices may vary. microMarc, microWriter, microLaser, Color Magic, and "Extending Your Reach" are trademarks of Texas Instruments Incorporated. OS/2 is a registered trademark of IBM, Corp. Mac is a registered trademark of Apple Computer, Inc. PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Windows is a registered trademark of Microsoft Corporation. PCL is a trademark of Hewlett-Packard, Inc. © 1994 TI.

8920
Forms Printer
Under $2,400.

A heavy duty ***dot matrix printer for up to 9-part business forms.*** Adjustable 18-pin printhead, five print speeds, Windows/DOS compatible, zero tear-off for form waste elimination.

You won't get thrown by a TI printer. You'll find 20 years of experience designed into a line of printers that redefines easy. A family of friendly printers that extend your reach – without extending your budget.

Easy to use. Take the guesswork out of setting up our family of page printers with features like TI's new Easy Select Windows Drivers. Just a few simple steps and your printer driver is automatically installed on your hard drive, without worrying about which buttons to push or which port to connect to. You'll find other friendly features like the Color Magic™ driver on our microMarc Color inkjet printer. It has easy to understand menus so even a beginner can print professional quality documents.

Easy to maintain. You'll find our printers virtually trouble-free. From printheads to toner cartridges to imaging units, our long-life consumables can be dropped into place in seconds — and they're economical enough to give you a very low cost per page. We have even eliminated the need for special tools to upgrade your printer. To add more memory to our microWriter or microLaser printers, simply remove two thumbscrews, pop in the board and you're done.

Easy to service. We've built our printers to be trouble-free, complete with a one-year limited warranty and a toll-free technical support line. So if you do have a question, you get live, friendly assistance from professionally trained technicians.

Easy to own. Our printers have the friendliest prices around. And we're so sure you'll like them, we offer a 30-day risk-free trial†† to make sure you're perfectly satisfied.

Easy to buy. Just call **1-800-TI-TEXAS** (1-800-848-3927). Ask us anything you want. We'll send you literature and competitive comparisons within 24 hours with all the details you'll need to find the TI printer that's just right for you.

EXTENDING YOUR REACH™

Texas Instruments

Ready! for OS/2

microWriter, microLaser Pro 600.

energy EPA POLLUTION PREVENTER

excluding the 8920 Forms Printer.

*Includes a $150 rebate on PS23 models purchased from July 1 through August 31, 1994. Dealer prices may vary.
††Offer applies to all new microMarc, microWriter, microLaser, and 8920 Forms printers, if returned in good condition.

Circle 154 on reader service card

FEATURES COMPARISON

Boca, ATI, and Diamond Dazzle the Windows Desktop

● Yes
○ No
n/a = not applicable

	Low-End Boards					Midrange Boards			
	BEST BUY Boca Voyager	Elsa Winner 100VL	miroCrystal 10SD	Paradise VL Plus	STB Express PCI	Actix Graphics Engine 64	BEST BUY ATI Graphics Xpression	Diamond Stealth 32	
Standard features									
Street price	$145	$169	$135	$139	$139	$279	$250	$249	
Bus	VL	VL	VL	VL	PCI	PCI	PCI	PCI, VL	
Graphics coprocessor	Chips and Technologies F64300	S3 86C805	S3 86C805	Western Digital 90C33	Avance Logic ALG2301	S3 Vision864	ATI 88000CX	Tseng Labs ET4000/ W32p	
RAM type	DRAM	DRAM	DRAM	DRAM	DRAM	DRAM	DRAM	DRAM	
Installed/maximum RAM (MB)	1/2	1/1	1/2	1/2	1/1	2/2	2/2	2/2	
Maximum horizontal scan rate (kHz)	60	100	80	58	60	86	80	80	
Bit path of chip	32-bit[3]	32-bit	32-bit	32-bit	32-bit	64-bit	64-bit	32-bit[4]	
Maximum noninterlaced refresh rate (Hz) at									
640 x 480	75	75	80	72	75	105	75	90	
800 x 600	75	75	80	72	75	92	75	90	
1024 x 768	75	75	80	72	75	86	70	75	
1280 x 1024	n/a	60	60	n/a	n/a	75	70	75	
Maximum colors (bits per pixel) at									
640 x 480	16	16	24	24	24	32	24	24	
800 x 600	8	16	16	16	16	16	24	24	
1024 x 768	8	8	8	8	8	16	16	16	
1280 x 1024	n/a	4	4	4	4	8	8	8	
Software utilities									
Virtual desktop	○	●	●	○	○	○	●	●	
VAFC/VMC	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○	
Full-motion video acceleration	○	○	○	○	○	○	●	○	
Windows resolution utility	●	●	●	●	●	○	●	●	
DPMS capability	●	●	●	○	●	●	●	●	
Non-Windows drivers									
OS/2	●	●	●	●	●	●	●	●	
NT	●	●	●	●	●	●	●	●	
WordPerfect	●	○	○	●	●	●	●	●	
Word	●	○	●	●	○	●	●	●	
WordStar	○	○	○	○	○	○	○	●	
1-2-3	●	○	●	●	●	●	○	●	
AutoCAD	●	●	●	●	●	●	●	●	
MicroStation	○	●	●	○	○	●	●	●	
Service and support									
Warranty (years)	5	3	2	3	lifetime	2	5	5	
Toll-free technical support	○	●	●	●	●	○	○	○	
Fax-back service	●	○	○	●	○	○	●	●	
BBS number	407/241-1601	415/615-5862	415/855-9944	714/753-1234	214/437-9615	408/970-3719	905/764-9404	408/730-1100	
CompuServe forum	●	●	○	○	●	●	●	●	
Phone number	407/997-6227	800/272-3572	800/862-5678	800/568-9272	800/234-4334	800/927-5557	905/882-2600	800/380-0030	
Fax number	407/997-0918	415/588-0113	415/855-9004	714/932-6498	214/234-1306	408/986-1647	905/882-2620	408/730-5750	
Reader service number	678	679	680	681	682	683	684	685	

[1] Street price of VL version $245. [2] Street price of VL version $260. [3] Cached. [4] Interleaved.

	Genoa Phantom 32i	Hercules Dynamite Power VL	Hercules Dynamite Pro ISA	miroCrystal 20SD	Number Nine #9GXE64	Orchid Kelvin 64	STB LightSpeed	STB Nitro	High-End Boards: ATI Graphics Pro Turbo	ATI Graphics Ultra Pro
	$260[1]	$237	$210	$235	$275	$275[2]	$259	$219	$380	$290
	PCI, VL	VL	ISA	PCI	PCI	PCI, VL	VL	PCI	PCI, VL	ISA, VL
	Tseng Labs ET4000/ W32p	Tseng Labs ET4000/ W32p	Tseng Labs ET4000/ W32i	S3 Vision864	S3 Vision864	Cirrus Logic GD5434	Tseng Labs ET4000/ W32p	Cirrus Logic GD5434	ATI 88000GX	ATI 68800
	DRAM	DRAM	DRAM	DRAM	DRAM	DRAM	DRAM	DRAM	VRAM	VRAM
	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/4	2/2
	78	78	64	85	96	65	80	64	80	80
	32-bit[4]	32-bit[4]	32-bit[4]	64-bit	64-bit	64-bit	32-bit[4]	64-bit	64-bit	32-bit
	114	90	90	100	150	75	90	75	100	100
	90	90	90	100	150	75	90	75	100	100
	84	76	75	100	126	75	75	75	100	90
	70	75	n/a	75	76	60	75	60	75	75
	24	24	24	24	32	24	24	16	32	24
	24	16	16	24	32	24	24	16	32	24
	16	8	8	16	16	16	16	8	16	16
	8	8	n/a	8	8	8	8	n/a	8	8
	○	○	○	●	●	●	○	○	●	●
	○/○	○/○	○/○	○/○	●/○	○/○	○/○	○/○	○/○	○/○
	○	○	○	○	●	●	○	○	●	●
	●	●	●	●	●	●	●	●	●	●
	○	●	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●	●	●
	●	●	●	○	○	●	●	●	●	●
	○	○	○	●	○	●	●	●	●	●
	○	○	○	○	○	○	●	●	○	○
	○	○	○	●	○	●	●	●	○	○
	○	●	●	●	●	●	●	●	●	●
	○	○	○	●	●	●	●	●	●	●
	2	2	2	2	5	4	lifetime	lifetime	5	5
	○	●	●	●	○	○	●	●	○	○
	○	○	○	○	●	○	○	○	●	●
	408/943-1231	510/623-7449	510/623-7449	415/855-9944	617/862-7502	510/683-0327	214/437-9615	214/437-9615	905/764-9404	905/764-9404
	●	●	●	○	○	●	●	●	●	●
	800/934-3662	800/532-0600	800/532-0600	800/862-5678	800/438-6463	800/767-2443	800/234-4334	800/234-4334	905/882-2600	905/882-2600
	408/434-0997	510/623-1112	510/623-1112	415/855-9004	617/674-2919	510/490-9312	214/234-1306	214/234-1306	905/882-2620	905/882-2620
	686	687	688	689	690	691	692	693	694	695

For more information about all products in this table, circle reader service no. 904.

Table continues on following page

FEATURES COMPARISON

Boca, ATI, and Diamond Dazzle the Windows Desktop continued

● Yes
○ No
n/a = not applicable

	High-End Boards						
	BEST BUY Diamond Stealth 64	Diamond Viper Pro	Hercules Graphite Power VL	Matrox MGA Ultima	Number Nine #9GXE64 Pro	VideoLogic 928Movie	VidTech GraphMax L12
Standard features							
Street price	$315	$599	$340	$442[1]	$356	$449	$320
Bus	PCI, VL	PCI	VL	ISA, PCI, VL	PCI	VL	VL
Graphics coprocessor	S3 Vision964	Weitek P9100	IIT AGX-016	Matrox MGA 64	S3 Vision964	S3 86C928	IIT AGX-016
RAM type	VRAM	VRAM	VRAM	VRAM	VRAM	VRAM	VRAM
Installed/maximum RAM (MB)	2/4	4/4	2/2	2/2	2/2	2/2	2/2
Maximum horizontal scan rate (kHz)	82	82	84	82	89	77	78
Bit path of chip	64-bit	32-bit[2]	32-bit	64-bit	64-bit	32-bit	32-bit
Maximum noninterlaced refresh rate (Hz) at							
640 x 480	120	120	150	120	150	75	120
800 x 600	120	120	120	120	150	75	100
1024 x 768	100	100	90	90[3]	126	75	80
1280 x 1024	75	80	80	76[4]	76	72	72
Maximum colors (bits per pixel) at							
640 x 480	24	24	24	24	32	24	24
800 x 600	24	24	24	24	32	24	24
1024 x 768	16	24	16	16	16	16	16
1280 x 1024	8	24	8	8	8	8	8
Software utilities							
Virtual desktop	●	○	●	●	●	●	○
VAFC/VMC	○/○	○/○	○/○	○/○[5]	●/○	●/●	○/○
Full-motion video acceleration	○	○	○	○	○	●[6]	○
Windows resolution utility	●	●	●	●	●	●	●
DPMS capability	●	●	○	●	●	○	○
Non-Windows drivers							
OS/2	●	●	○	●	●	○	●
NT	●	●	●	●	●	○	●
WordPerfect	●	○	○	○	○	●	●
Word	●	○	○	○	○	●	○
WordStar	○	○	○	○	○	○	○
1-2-3	●	○	○	○	○	●	○
AutoCAD	●	●	●	●	●	●	●
MicroStation	●	●	○	●	●	○	●
Service and support							
Warranty (years)	5	5	2	2	5	1	5
Toll-free technical support	○	○	●	○	○	○	●
Fax-back service	●	●	○	●	●	●	○
BBS number	408/730-1100	408/730-1100	510/623-7449	514/685-6008	617/862-7502	617/494-4960	612/633-3301
CompuServe forum	●	●	●	●	○	●	○
Phone number	800/380-0030	800/380-0030	800/532-0600	800/361-1408	800/438-6463	800/578-5644	800/752-8033
Fax number	408/730-5750	408/730-5750	510/623-1112	514/685-2853	617/674-2919	617/494-0534	612/633-9164
Reader service number	696	697	698	699	700	701	702

[1] Street price of ISA version $500; street price of PCI version $400.
[2] Interleaved.
[3] ISA version supports 120-Hz refresh.
[4] ISA version supports 90-Hz refresh.
[5] PCI version includes VAFC connector.
[6] Includes separate video chip and audio chip.

For more information about all products in this table, circle reader service no. 904.

It's a Jungle Out There... May the Fittest Survive.

Estimated Retail Price $799

This monitor has a lot of concern for the environment (Green Energy–EPA Energy Star, VESA DPMS, no CFC, SWEDAC MPR II).

This monitor has a lot of display area (118 square inches),

And this monitor has a 0.26mm dot pitch, and a 1280 x 1024 maximum resolution,

which means while this monitor has enormous respect for your wallet,

That's why this monitor should also appeal to your sense of responsibility and value.

Estimated Street Price $755

This monitor has it, too. (EPA Energy Star, VESA DPMS, SWEDAC MPR II).

This monitor has a lot less. (27 square inches less).

This monitor has neither.

this monitor does not.

And this monitor should not.

MAG INNOVISION

So call us at 1-800-827-3998 (1-714-751-2008 in CA) for more information on this monitor.

Circle 169 on reader service card

PCW INFO HOTLINE: INSTANT FAX BACK
1-800-234-0455 ext. 301

PC WORLD TEST CENTER REPORT

PCI Boards Have the Speed Edge

	Bus type	Word 2.0 for Windows	Excel 4.0 for Windows	CorelDraw 3.0	PhotoStyler 1.1	QuarkXPress 3.11	Freelance Graphics 2.01	Total WITS score
ATI Graphics Pro Turbo	PCI	13.59	17.94	13.61	11.56	16.23	6.72	79.65
Number Nine #9GXE64 Pro	PCI	13.67	16.82	12.91	11.85	15.55	7.98	78.78
Diamond Stealth 64	PCI	13.27	17.59	13.86	11.75	13.26	7.61	77.34
Diamond Stealth 64	VL	13.52	17.88	13.07	11.22	12.86	8.5	77.05
ATI Graphics Pro Turbo	VL	13.57	17.16	13.33	11.07	15.28	6.19	76.6
ATI Graphics Xpression	PCI	13.36	16.56	13.17	11.6	15.62	4.76	75.07
Diamond Viper Pro	PCI	13.76	16.72	14.85	11.48	14.33	3.43	74.57
Matrox MGA Ultima PCI	PCI	13.61	17.26	12.66	11.56	14.55	3.69	73.33
Diamond Stealth 32	PCI	13.64	15.54	13.29	11.54	12.21	6.01	72.23
STB LightSpeed	VL	12.53	14.47	12.57	11.35	14.68	5.9	71.5
Hercules Dynamite Power VL	VL	12.72	14.2	12.76	11.34	14.44	5.45	70.91
Genoa Phantom 32i 8900PCI	PCI	12.79	13.38	12.61	11.65	14.79	5.54	70.76
Matrox MGA Ultima VLB	VL	13.41	16.62	11.79	10.93	14.09	3.67	70.51
Genoa Phantom 32i 8900VL	VL	12.4	13.78	12.5	11.44	14.39	5.75	70.26
STB Nitro	PCI	12.23	13.44	13.08	12.55	14.71	4.14	70.15
Number Nine #9GXE64	PCI	12.81	14.74	10.3	11.47	14.27	6.49	70.08
Orchid Kelvin 64 PCI	PCI	11.75	13.45	13.1	12.61	14.58	4.19	69.68
Diamond Stealth 32	VL	13.44	14.19	13.11	11.22	11.99	5.54	69.49
Boca Voyager	VL	12.64	13.77	12.77	11.56	14.05	4.63	69.42
Hercules Graphite Power VL	VL	12.59	13.4	12.37	11.58	14.04	4.32	68.3
Orchid Kelvin 64 VLB	VL	11.8	13.15	13.17	11.7	14.11	4.17	68.1
VidTech GraphMax L12	VL	12.4	13.46	12.54	11.5	13.72	4.26	67.88
Hercules Dynamite Pro ISA	ISA	12.27	13.06	12.55	10.48	13.5	5.25	67.11
Matrox MGA Ultima ISA	ISA	12.69	14.66	11.31	10.98	13.2	3.21	66.05
Actix GraphicsEngine 64	PCI	11.84	13.71	8.84	11.72	13.19	6.33	65.63
ATI Graphics Ultra Pro	VL	12.62	13.4	10.61	11.22	13.17	4.03	65.05
miroCrystal 20SD	PCI	11.92	11.72	8.91	12	12.74	5.46	62.75
STB Express PCI	PCI	11.8	10.78	12.89	11.76	13.28	1.9	62.41
VideoLogic 928Movie	VL	11.83	11.42	10.35	10.94	13.19	4.17	61.9
Paradise VL Plus	VL	11.44	10.54	11.07	11.54	13.13	2.7	60.42
miroCrystal 10SD	VL	10.74	10.25	8.89	11.73	12.12	2.62	56.35
ATI Graphics Ultra Pro	ISA	10.59	11.14	9.44	9.55	11.11	3.64	55.47
Elsa Winner 100VL	VL	10.28	9.83	9.42	10.5	11.57	2.14	53.74

Best Buys in red

Methodology

Boards were tested on a 486DX2-66 system with 16MB of RAM and 256K of secondary cache. Application scores are the factor by which a board exceeds our baseline system, an unaccelerated ET4000-based VGA adapter on a 386DX-25 with 16MB of RAM. WITS scores are the sum of the application scores. Larger is better.

Data based on tests designed by the PC World Test Center in conjunction with Jon Peddie Associates and conducted by Jon Peddie Associates. All rights reserved.

World Class. Again.

Talk about heavy medal. We just won the 1994 *PC World* World Class Award for Best Mail-Order Company—for an unprecedented fourth time! Apparently, a lot of PC users have discovered our toll-free technical support, $5 overnight shipping, low catalog prices, and knowledgeable salespeople. See how it feels to deal with a winner—give us a call today and experience the difference!

PC Connection®

800-800-0003

We're World Class

Call for a FREE Catalog!
800-800-0003

The Best By Any Measure. Since 1982,

PC Connection has pioneered the services that have set the standards for mail order, like

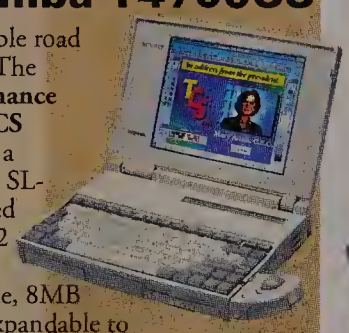
$5 Overnight Shipping
Toll-free Technical Support
Customized Systems Overnight

And we have more than 3500 different products in stock; so if you don't see something, just give us a call. Version numbers are current at press time.
Note: Products listed in red are Microsoft Windows Applications.

PC WORLD WORLD CLASS AWARD

HOURS:
8 a.m. Monday continuous thru 5 p.m. Sunday ET

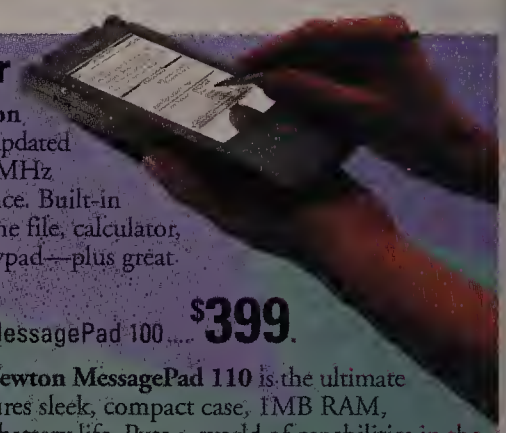
Toshiba T4700CS



Affordable road power! The **Performance T4700CS** features a 50MHz SL-enhanced 486DX2 (3.3v), 8K cache, 8MB RAM expandable to 24MB, 9.5" Dynamic-STN color LCD display, audio capabilities, 200MB Drive.

14354 Performance T4700CS ..... $3199.
14355 T4700CS (320MB) ..... 3449.

Apple Computer



The affordable, new **Apple Newton MessagePad 100** is here! Features updated 4MB ROM, 640K RAM, and 20MHz processor for improved performance. Built-in notepad, to-do list, datebook, name file, calculator, pop-up software keypad—plus great low price!

1338 Newton MessagePad 100 ..... $399.

The **Apple Newton MessagePad 110** is the ultimate PDA! Features sleek, compact case, 1MB RAM, increased battery life. Puts a world of capabilities in the palm of your hand, yet it weighs just 1.28 pounds!

New Product!

1332 Newton MessagePad 110 ..... $599.
14197 Windows Connection Kit 99.95

New After Dark 3.0

Berkeley's **After Dark** 3.0 is wilder, weirder, and wackier than ever! Watch Bad Dog trash your desktop, try your luck at the track with Rat Race, and soar with the majestic, new Flying Toasters!

9885 After Dark for Windows 3.0 ..... $29.95

COMPUTERS

Monitors not included with systems.

Compaq Computer ... 3 years
11415 Contura CX w/209MB, Windows .. $2799.
11416 Contura CX w/120MB, Windows .... 2599.
11417 4/25c w/209MB, Windows (wsl) ..... 2399.
11418 4/25c w/120MB, Windows (wsl) ..... 2099.
IBM PC Company
4263 ValuePoint Si 4/25 w/120MB ..... 929.
4273 ValuePoint Si 4/33DX w/120MB ..... 1249.
10496 ThinkPad 360 Mono w/120MB ..... 1999.
11786 360CS Dual Scan Color w/170MB... 2599.
15997 510CS Dual Scan Color w/200MB... 2399.
NEC Technologies Inc.
12941 Ready Multimedia 4/33DX w/ 270MB 1449.
Texas Instruments TM 4000E Systems
13312 WinDX 2/50 Mono w/200MB ..... $2279.
6441 WinDX 2/50 Active Matrix 200MB 2879.
8934 WinSX/25 Mono w/120MB..... 1679.
1620 WinDX 4/75C Active Matrix 340MB 3639.
1623 WinDX 4/75C Active Matrix 455MB 4479.
Toshiba Satellite Laptops
14354 T4700CS Passive Color w/200MB 3199.
14355 T4700CS Passive Color w/320MB 3449.
14347 T3400 Mono Subnotebook..... 1739.
14348 T3400CT Active Color Subnotebook 3419.

BUSINESS APPLICATIONS

Aldus
14335 TouchBase for Windows 29.95
Borland ... while supplies last
11907 dBASE 5.0 for Windows 349.95
11945 dBASE 5.0 for Win. Version Upg..... 199.
Claris Corporation
6022 CWorks 65.95 5257 FileM. Pro 2.1 119.95
Intuit
2426 Quicken for DOS or 5596 Win. ea. 42.95
Lotus
5982 SmartSuite $469.95 11771 Upg. $289.95
3428 1-2-3 4.0 - Win. Upg. (3424 5¼") ... 99.95
MECA ... 60 day MBG
2798 Manag. Your Money 10.0 (3½" only) 34.95
Microsoft
7009 Windows 3.11 (7010 5¼") 95.95
7811 Word 6.0 299.95 5509 Acc 2.0 (3½") 299.95
8138 Office 4.2 479.95 11336 Upgrade 279.95
Road Scholar Software, Inc.
1318 City Streets 59.95
Software Publishing
4402 Harvard Graphics 2.0 (4403 5¼") 279.95
Symantec
1625 ACT! DOS 2.11..... 264.95
7435 ACT! Windows 2.0 (3½" only)..... 189.95
WordPerfect Corporation (wsl)
15866 InfoCentral 1.0 (3½" only, wsl)..... 99.95
3795 WordPerfect 6.0 (wsl)..... 299.95
12914 for Win. 279.95 12963 for Win. Upg. 89.95

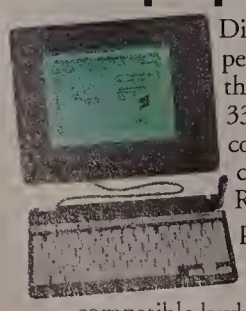
GRAPHICS & DESIGN

Abracadata, Ltd.
13046 Design Own Home -Arch. Windows 29.95
Adobe Systems
2296 Adobe Photoshop w/ video 569.95
12973 Illustrator 449.95
Aldus
13791 PageMaker 579.95 6678 Upg. 145.95
1085 FreeHand for Windows (3½" only) 389.95
Altamira
15573 Composer 529.95
Altsys Corporation
8675 Fontographer for Windows 3.5 ..... 259.95
Corel Systems
8498 CorelDRAW! 5.0 CD-ROM 459.95
11895 4.0 CD-ROM 269.95 2618 3.0 99.95
Fractal Design
4356 Painter 2.0 259.95 13218 Painter X2 89.95
HSC Software ... 30 day MBG
13956 Kai's Power Tools Windows 119.95
Inset Systems
3820 HiJaak PRO 2.0 for Win. (3½" only) 84.95
7114 OOgler 19.95
Micrografx
15742 Windows Draw! Value Pak 48.95
7307 Designer 4.0 (3½" only)..... 469.95
North Coast Software
15884 Morphology CD-ROM 19.95
6992 PhotoMorph 1.0 for Windows 89.95
Shapeware
Visio Exp. SSuite or MS Office ea. 48.95
5426 Visio 2.0 for Win. (3½" only)..... 119.95
T/Maker
4680 Incredible ImagePak Windows 89.95
15062 Studio Ser. Design Group CD-ROM 189.95

COMMUNICATIONS

Asanté Technologies Hubs ... 5 years
2775 8 Port..... 249. 2772 12 Port..... 499.
Artisoft Simply LANtastic
15595 Starter Kit 199. 14742 Add-on Kit 99.95
BOCA Research FaxModems ... 5 years
8397 M144IW... 99.95 8398 M144EW... 129.95
Data Storm PROCOMM PLUS
4798 2.01 69.95 2006 2.0 Windows..... 95.95
DCA/Crosstalk
5611 Crosstalk 2.0 for Windows..... 99.95
Delrina Technology
2446 WinFax PRO 4.0 ..... $84.95
14072 Communications Suite 119.95
Hayes ... 2 years
11396 Accura 144+Fax144 (external)..... 149.95
1118 Accura 288+FAX144..... 279.95
12820 OPTIMA 288+FAX144..... 449.95
Hilgraeve HyperACCESS
12081 Windows.... 84.95 8204 DOS..... 59.95
IBM
13207 FaxModem (int.) (P/N MOD531)..... 49.95
Intel ... 3 years
2994 EtherExpress 16 or 3021 16 TP ea. 99.95
5994 SatisFAXtion Modem/400..... 285.95
12934 14.4 PCMCIA FaxModem 209.95
Megahertz ... 5 years
10515 C5144 14.4 FaxModem (Compaq) 419.95
12763 XJ1144 14400 FaxMod. (PCMCIA) 219.95
Microcom ... 30 MBG
CarbonCopy DOS or Windows..... 129.95
14931 DP FAST 28.8 ES 249.95 14932 EP 339.95
Norton-Lambert
2754 Close-Up Host & Remote 6.0..... 119.95
Novell Netware 4.01
12058 (10 user)... 1999. 12056 (25 user)... 3049.
Practical Peripherals ... lifetime
4744 PM144MT II..... 129.95
4804 PM288MT II V.FC..... 259.95
Server Technology
7779 Remote Power on/OFF+AUX 119.95
Shiva
14837 NetModem/E 1.5..... 1479.
Supra FaxModems... 5 years
5252 144LC FxM 129.95 2393 FxM 28.8K 249.95
Traveling Software
4407 LapLink V ..... 99.
U.S. Robotics
11923 Spstr. 14.4 FM Int. 124.95 11924 Ext. 149.95
6631 WorldPort 14.4 PCMCIA FaxMod. 209.95
12618 28.8 FM (ext.) 239.95 12619 (int.) 219.95
Zoom Telephonics ... 7 years
14763 FaxModem VFP 28.8K (internal).... 189.95
15364 FaxModem VFX 28.8K (external)... 229.95
4428 FaxModem VFXV .32 bis (external) 139.95
4429 FaxModem VFPV .32 bis (internal) 99.95

Compaq Concerto



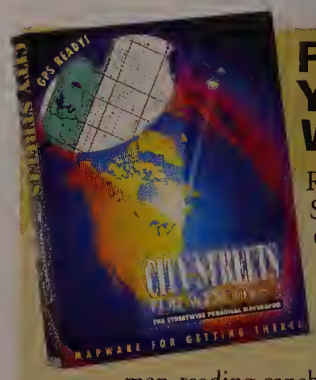
Discover the ease of pen computing with the **Concerto 4/33**. 33MHz 486DX w/ coprocessor, 8K cache, 4MB of RAM, 9.5" passive matrix monochrome VGA display, 101 KEY compatible keyboard with special-feature hotkeys, 250MB Drive.

13557 Concerto 4/33 M250..... $1399.
13558 Concerto 4/25 M120..... 1229.
13553 Concerto 4/25 M250..... 1319.

Compaq Contura Aero

The **Contura Aero 4/25 Model 170** weighs just 3.5 pounds! 25MHz 486SX w/8K cache, 4MB RAM expandable to 12MB, 8" backlit VGA monochrome display, built-in trackball, 170MB Hard Drive.

15748 Contura Aero 4/25 Model 170..... $1419.
15747 Contura Aero 4/25 Model 84..... 999.



Find Your Way

Road Scholar's **City Streets** for Windows gives you powerful map-reading capabilities. Import maps and instantly find any address, calculate distance, zoom in and out, and more. Provides support for Global Positioning System.

1318 City Streets..... $59.95

You're The Winner.

PCTV

EXPERT ADVICE FREE ON TV!

Don't just read about new computer products...
Watch them in action on:

COMPUTER CHRONICLES

MacTV PCTV

Stewart Cheifet

For schedule information call:

603-863-9322

PROGRAMMING/UTILITIES

Berkeley Systems
6642 Oisney Coll. Scrn. Saver (3½" only) $29.95
After Oark DDS or Windows 29.95
5434 Star Trek: Screen Poster/Saver Bun. 39.
Central Point Software PC Tools
12833 Pro... 94.95 11395 for Windows ... 89.95
Chili Pepper Software
15994 Infinite Disk 79.95
DataViz, Inc.
6508 Conv. Plus for Win. 2.5 (3½" only) 89.95
Delrina
9853 Opus 'n Bill Screen Saver..... 29.95
Helix Software
9627 Netroom 3 (single user)..... 59.95
MicroHelp, Inc.
14787 UnInstaller for Windows (3½" only) 39.95
Microsoft
10154 Visual Basic St. 129.95 10437 Pro 319.95
11504 Visual C++ Pro1.5 (CD only)..... 399.95
Pacific Microelectronics
13089 Mac-In-DOS for Windows..... 95.
Powersoft
15847 PowerBuilder Desktop 229.95
12930 PowerViewer 84.95
12929 PowerMaker..... 169.95
Qualitas
12541 386MAX 7.0 (3½" only)..... 61.95
Quarterdeck
3217 QEMM 7.0 (3221 5¼")..... 59.95
Symantec
2360 Norton Desktop Windows 115.95
5136 The Norton Utilities 8.0 ..... 115.95
8535 pcAnyw. DDS 119.95 11303 Win. 129.95

INPUT/OUTPUT

Caere ... 1 year
4277 OmniScan (w/DmniPage Direct) 209.95
Canon Bubble Jet Printers ... 1 year
15187 BJ200E 299.95 9614 BJ-600 Color 589.95
CoStar ... 1 year
2365 LabelWriter XL Plus 239.95
Epson ... 1 year
11800 LQ570+ (80 col., 269 cps)..... 259.95
12353 Action Laser 1600..... 1029.95
Hewlett-Packard ... 3 years
4178 LaserJet 4 Plus $1499.95
13682 LaserJet 4P 999.95
12212 LaserJet 4L..... 699.95
15857 Color DeskJet 560C..... 579.95
IBM Keyboards
13488 Basic (570) 57.95 13485 Pro (571) 89.95
Kensington Mouse ... 1 year
7899 Expert 4.0 (ser.) 99.95 7900 (bus) 114.95
Logitech ... limited lifetime
3996 Trackman2 (combo)..... 89.95
3295 Mouseman (combo)..... 45.95
7133 PowerPage (scan, fax, copy, & OCR) 499.95
7463 ScanMan Easy Touch for Windows 229.95
Microsoft ... lifetime
7597 Serial Mouse 69.95 2898 w/Win. 144.95
1896 Ballpoint Mouse 79.95
Microtek ... 1 year
13362 Scan-in-Dex 219.95 13361 Scooter 299.95
13360 ScanMaker IISP 749.95 13359 IIG 429.95
1679 ScanMaker III 2459.95 1690 IIHR 1069.95
Seiko ... 1 year
1506 Smart Label Printer Pro..... 249.95
Texas Instruments microLaser Pro 600
13658 microLaser Pro 600 PS23..... 1399.
13659 microLaser Pro 600 PS65..... 1599.
UMAX ... 1 year
15897 VISTA 599.95
13514 ScanDFFICE for Windows..... 739.95
Xerox
13028 TextBridge (DCR)..... $65.95

VIDEO & SOUND

Adobe Systems ... 120 day MBG
12891 Premiere 1.0 for Win. (3½" only) 179.95
Advanced Digital Systems
13985 VGA TV-Elite 249.95 15138 (int.) 189.95
ATI Technologies Graphics Pro ... 5 years
14101 Graphics Xpression 64 Accelerat. 219.95
Cardinal Technologies ... lifetime
1543 Sensory Starter Multimedia Kit 249.95
Creative Labs ... 1 year
5770 Sound Blaster 16 MCD ASP 179.95
3203 Game Blaster Multimedia Upg. Kit 419.95
Diamond Computer ... 5 years
Stealth 32 PCI or VLB 1MB ea..... 179.95
1585 Viper VLB 349.95 15008 PCI..... 369.95
Hauppauge
2442 Win/TV Celebrity NTSC..... 399.95
10593 Win/TV w/Microsoft Video Win.... 419.95
Intel ... 3 years
11587 Smart Video Recorder..... 369.95
MAG Innovision Monitors
16194 DX17F..... 759. 16195 DX15F..... 409.
NEC MultiSync Monitors ... 2 years
14317 3V..... 499.95 11948 4FGE..... 659.95
Number Nine
1871 #9GXE (1MB) ISA 3230 VLB... ea. 249.95
Sony ... 1 year
15672 CDU33A (internal DS CD-RDM)..... 159.95
11810 15SF 15" Monitor..... 499.95
14112 GDM-17se1 17"..... 1099.

DRIVES

Colorado Memory Systems ... 1 year
4354 Jumbo 250 Tape Backup..... 179.95
1073 Trakker 250 Tape Bckp. (parallel) 349.95
Iomega ... 1 year
13803 Bernoulli Insider 150 IDE..... 489.95
10602 Bernoulli 150MB Cartridge..... 99.95
10452 Transportable MultiDisk 150 ..... 559.95
10537 PC Powered 150 PRD..... 479.95
2530 90MB Cart. 89.95 2467 Tripak 259.95
MDS ... 1 year
11851 105MB 3.5" Int. Removable IDE... 279.95
12534 Syq. 270MB Removable Drive..... 499.95
NEC CD-ROM Drives... 2 years
13341 CDR-500 MultiSpin 3xi..... 469.95
13340 CDR-600 MultiSpin 3xe..... 499.95
TEAC AT Drives ... 1 year
6951 1.2MB..... 55.95 7371 1.44MB..... 44.95

Inset Systems

Convert 70+ image formats, capture screens, and browse image "thumbnails" with **HiJaak PRO for Windows**. View images regardless of format with **OOgler**. Simply click & view! View PhotoCDs, CompuServe GIFs, & more.

3820 HiJaak PRO 2.0 for Windows..... $84.95
7114 OOgler..... 19.95

Great Drive Deals

Conner **Filepro Hard Drives** offer an exceptional data storage value. These internal drives offer 14ms or faster access time, self-parking heads, and buffers for superfast data retrieval.

14307 CFS 210A (213MB) $229.95
14306 CFA 340A (343MB)..... 289.95
14303 CFS 420A (426MB)..... 329.95

ACCESSORIES/DISKS

American Power ... 2 years
3819 Back-UPS 250 109.95 3858 400... $169.95
Cyrix Microprocessor Upgrades
10538 486 DRX2 25/50 Microproc. Upg. .. 299.95
14035 486 SRX2 20/40 Microproc. Upg.... 239.95
2563 486 DRX2 33/66 Microproc. Upg. .. 339.95
Fuji Disks ... lifetime
2215 3.5" HD (10) 10.95 6286 3.5" HD (20) 19.95
Intel ... lifetime
3573 DX2 Dverdrive Processor 66MHz 319.95
Kensington Full line avail. ... 1 year
7060 MicroSaver Security System..... 39.95
PC Power & Cooling ... 2 years
7915 Turbo Cool 300..... 159.
Sony Disks/Cartridges
6375 3.5" HD (30).... 29.95 11871 (100).... 79.95
Targus Cases ... lifetime
7369 Notepac... 35.95 1305 Universal..... 69.
Tripp Lite ... 2 years
6199 Isobar 4-6.... 43. 6200 Isobar 6-6.... 49.

IBM ThinkPad®360

The **ThinkPad® 360** gives you a 33-MHz 486SX processor with 8K cache, 4MB RAM expandable to 20 MB, 9.5" STN-LCD backlit display with 64 gray scales, local bus graphics, 1MB video RAM, NiMH battery, 170MB Drive.

10496 ThinkPad® 360 Model 170 ..... $1999.
10497 ThinkPad® 360 Model 340 2499.

PC Connection®

800-800-0003 994PCW

6 Mill Street, Marlow, NH 03456
SALES 603-446-0003 **FAX** 603-446-7791

OUR POLICY

- VISA, MASTERCARD, AMEX. No surcharge.
- Your credit card is not charged until we ship.
- If we must ship a partial order, we pay freight on shipment(s) that complete the order (in U.S.).
- No sales tax, except Ohio (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPD orders shipped First Class Mail.
- International orders: Add 2% surcharge and $2.30 insurance. Manufacturer support and upgrade eligibility may be limited outside the U.S.A. Some products not available for export, call or fax for information.
- CDD maximum $1000. Cash or certified check. COD orders require an additional $4.50 charge, ship via UPS and may require addt'l UPS charges.
- 120 day limited warranty on all products. Defective software replaced immediately.
- Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- We are not responsible for typographical errors.

SHIPPING

Continental U.S.: Total shipping charge on any order is $5. Barring events beyond our control, all credit card orders (non-CODs) phoned in weekdays by 3 a.m. ET will ship Airborne Express for delivery the next business day. That's *same day* delivery for orders placed between midnight and 3 a.m.! (Some orders ship UPS Ground for next day delivery). Saturday delivery available to many areas upon request at no additional charge. Order all day Saturday thru noon Sunday for Monday delivery. Some areas required an extra day delivery.

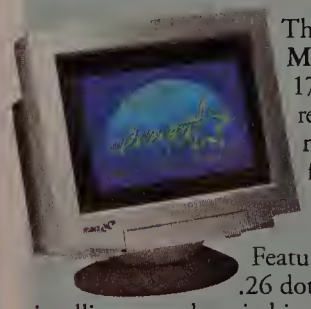
Hawaii, Alaska, Canada, Puerto Rico & U.S. Virgin Islands: Shipping may require additional time/charges.

All other areas: Please call 603-446-0003 or FAX 603-446-7791 for information. Business offices: 603-446-7711 M-F 9 a.m. - 5:30 p.m. ET.

HOURS

8 a.m. Monday continuous thru 5 p.m. Sunday ET

MAG InnoVision



The **DX17F Monitor** is a 17" ultra-high resolution multi-frequency analog color monitor. Features include .26 dot pitch, intelligent mode switching, digital controls, and maximum resolution of 1280 x 1024 non-interlaced.

16194 DX17F Monitor..... $759.
16195 DX15F Monitor..... 409.

© Copyright 1994 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH. MacTV is a trademark of PC Connection, Inc.

THE RIGHT

CONNECTIONS

High-speed fax-modems let you connect to colleagues, hop onto online services, and send faxes in a flash. Our reviewers choose the best of 23 models, with prices as low as $110.

No business is an island. But if your office isn't well equipped with tools for data and fax communications, you might as well be headquartered in Bora Bora. You already have a phone, and probably a fax machine as well, but have you considered getting a fax-modem?

As more businesses and services get wired, and as electronic mail vies with the phone as the best way to reach business contacts, the data functions of fax-modems are expanding exponentially. A fax-modem lets you connect to online services, like CompuServe and America Online; hop onto the information superhighway via the Internet; and hook up to any of the thousands of electronic bulletin board systems that are currently in operation.

In addition to transmitting data, fax-modems also allow you to send and receive fax transmissions directly from your computer—saving time, paper, and hassle. Instead of first printing out a document and then feeding it through a fax machine, you can send an electronic copy without leaving your desk. Want to send a fax to 20 people? No need to stand at the fax machine feeding and refeeding sheets of paper. A fax-modem can send a document to 20 people as easily as it can to just

BY JEFFREY GORDON ANGUS

STAN MUSILEK

1 person. And your recipients get a much clearer copy of the original, even if they have traditional fax machines.

A Multitude of Modems

This review covers 23 fax-modem solutions, complete with hardware and software. All but two are internal cards that fit into a slot in your computer (the Hayes Accura 28.8 V.FC + Fax and the Microcom DeskPorte Fast ES 28.8 connect externally to your computer via the serial port). Most of the internal models are also available in external versions. Of the two external units we reviewed, the Microcom device lacks an internal counterpart, but an internal version of the Hayes Accura 28.8 V.FC + Fax should be available later this year.

All the fax-modems we reviewed can transmit faxes and data at 14.4 kilobits per second (kbps), and eight support data transmission speeds of 19.2 kbps or 28.8 kbps. The 14.4-kbps devices should suffice in most situations, because your transmission speeds will only be as fast as those supported by the fax machine or fax-modem on the other end—and relatively few devices currently support higher speeds. None of the major online services and few BBSes do, and most business fax machines still transmit and receive at 9600 kbps only.

Your initial investment in a 19.2-kbps or 28.8-kbps fax-modem will probably be higher than what you would pay for a 14.4-kbps device. However, these higher-speed units can shuttle the same amount of data in as little as half the time, saving you money on long-distance phone bills—in theory, anyway. The reality is that it can be difficult to establish higher-speed connections. Because manufacturers have failed to implement the 19.2-kbps and 28.8-kbps speeds uniformly, these fax-modems are sometimes incompatible with each other. The 14.4-kbps devices are more reliable at their top speeds because they are based on the V.32bis specification established by the International Telecommunications Union (ITU), an international standards committee—whereas the 19.2-kbps and 28.8-kbps units adhere to loosely defined protocols (such as V.32terbo and V.fc) established by the individual chip makers.

Because manufacturers have failed to implement the 19.2-kbps and 28.8-kbps speeds uniformly, these fax-modems are sometimes incompatible with each other.

Despite the numerous drawbacks of high-speed fax-modems, they will serve you well on the Internet and in distributed work groups with remote offices. In a distributed work group, you probably know exactly what kind of fax-modem you're connecting to on the other end; this virtually eliminates compatibility problems and transmission errors. If you want speeds higher than 14.4 kbps for your work group but need to keep costs under $200 per unit, check out one of the 19.2-kbps models. Street-priced at $199 and $135 respectively, the ATI 19200 ETC-I and the Cardinal MVP 192I give you higher-speed data transmission when communicating with similar V.32terbo units. You may not always succeed in establishing 19.2-kbps connections, but at least you're not shelling out the $30 to $165 premium the average 28.8-kbps device commands.

The Internet is so huge that it's hard to know how many of its nodes or local-access providers send and receive data at 19.2 or 28.8 kbps. But there are good reasons to think the faster speeds will quickly be adopted: With an estimated 25 million people currently using the Internet, the number of data transfers is enormous. Also, the most popular front-end software for the Internet, Mosaic, runs best with these higher-speed connections.

All six of the 28.8-kbps fax-modems in this review achieve their high speeds using the V.fast class (V.fc) protocol. However, by the time you read this article, several fax-modem makers, including Motorola, MultiTech, and U.S. Robotics, will be selling fax-modems that adhere to the new *V.34* data transmission standard. (A standard is a set of rules for transmission agreed upon by a committee of industry leaders, implemented uniformly by manufacturers to ensure compatibility.)

Like V.fc, V.34 has a maximum speed (without compression) of 28.8 kbps. But since V.34 is a standard, we expect it to supersede the less-robust (and less-than-standard) V.fc protocol. V.34 will also have powerful features that allow it to establish high-speed transmissions more successfully. At press time, few vendors indicated

Best Buys

While many of the fax-modems in this review are good values, only three earn a Best Buy: The AT&T Dataport 14.4/Datafax, Intel Faxmodem, and U.S. Robotics Sportster 14,400 all have low prices, are easy to install and use, and are excellent values overall. All three are 14.4-kbps internal cards.

AT&T Dataport 14.4/Datafax

Intel Faxmodem

they would charge a premium for V.34 devices; this fact, combined with V.34's technological advances over V.fc, makes us wary of recommending any of the V.fc devices in this review. Wait and buy a V.34 unit instead—you'll be much happier in the long run. (See the sidebar "V.34—This Fall's Hot Ticket" for more details.)

Installing an Internal Fax-Modem

Before installing an internal fax-modem, make sure to take the following steps.

✓ Choose the right COM port and IRQ (interrupt request) line before you install the fax-modem card. You don't have to understand the nuances of these terms, but there are a few rules to follow: Read the installation instructions, don't automatically accept the vendor's default, and choose a COM port and, ideally, an IRQ that are not being used by another device. Normally, the COM1 and COM3 ports share IRQ 4, and COM2 and COM4 both use IRQ 3.

✓ In the Windows Control Panel, open Ports, then the COM port to which you've assigned the fax-modem. You need to confirm that the port's baud rate setting is at 19.2 kbps (if your machine supports this) or at 9600 bps.

✓ When you install the bundled software or use your existing fax and data communications programs, check to see that their fax-modem and port settings match those of your equipment. If the software lets you change the initialization string, consider looking through the documentation to figure out what might work better.

Getting the Most From Your Modem

All fax-modems come with industry-standard error-control and data-compression features that improve the quality and speed of your transmissions. For data, they all support V.42 error checking and V.42bis and MNP-5 data compression.

V.42bis compression speeds your data's throughput as much as four times, depending on the type of files you send. Unfortunately, some implementations of V.42bis are incompatible with each other. If you see gibberish on your screen when your machine is receiving data from another modem with V.42bis, you may have to turn off your V.42bis compression.

All the fax-modems in our review also conform to the group III standard used by most fax machines and fax-modems today. This means they can communicate with virtually any other fax device.

Bargains Abound

You'll be glad to know that even the fast fax-modems are relatively cheap. All models in this review were selling for $300 or less on the street at press time—and will probably cost even less by the time you read this article. Internal cards tend to be least expensive; among these, the 14.4-kbps fax-modems are generally the most economical, starting as low as $110 for the Digicom Systems Connection 14.4 DF. The 28.8-kbps devices go for $219 to $300.

If you're willing to spend the extra $20 to $80 vendors charge for external versions of the internal fax-modems in this review, you'll get a few benefits, such as easier installation (since the external units simply plug into the serial port) and the ability to move the device easily among computers—an important consideration for work groups in which not every user has a fax-modem. Also, external units have lights and LEDs that can provide useful information about the status of your transmissions.

U.S. Robotics Sportster 14,400

But before you buy an external, check to see if your PC has the 16550 UART (Universal Asynchronous Receiver Transmitter), a serial device component that converts the incoming fax and data transmissions into a format the computer is capable of understanding, and that allows fast transmission through the serial port.

Look to the Future

Another factor you should consider before selecting a fax-modem is its compatibility with software. While all products in this review come with bundled software, the packages tend to be stripped-down versions of their full-featured retail counterparts. If you use your fax-modem often, you may eventually find yourself shopping for more-robust stand-alone software. (See our August review of fax software, "PC Faxing: Convenient, but...," for the best stand-alone packages.)

Before you buy a new software package, make sure it's compatible with the fax-modem you already own. The relevant classifications for fax-modem and software compatibility are Class 1, Class 2, and CAS. Class 1 fax-modems rely on your system's CPU to negotiate connection speeds, repaginate files for transmission, and perform many other functions. Class 2 devices perform most functions without involving the CPU, allowing smoother background operations in Windows. CAS, a protocol developed by Intel and used in its SatisFaxtion Modem/400, takes even more of the processing burden off the CPU. While Intel is the main company using this standard, you'll have no trouble finding software that supports CAS.

The Best of the Bunch

We selected our Best Buys based on a balance of price, speed, ease of use, features, and service and support policies. Three products stood above the rest: AT&T's DataPort 14.4/Datafax, Intel's Faxmodem,

and U.S. Robotics' Sportster 14,400. Both the AT&T and the Intel devices were extremely easy to install and use. The reasonably priced $149 AT&T DataPort model comes with a lifetime warranty, toll-free technical support, and a very good feature set, including small niceties such as a speaker that automatically lowers its volume after establishing a connection so you don't have to listen to modem hisses.

The $129 Intel unit stands out for its low price and easy installation, which even novices can perform without a hitch, thanks in part to its ability to automatically find an available COM port and IRQ setting (IRQ stands for *interrupt request,* a signal from a device requesting the CPU's attention). The $119 U.S. Robotics device offers a low price, excellent ease of use, and an intelligently customized software bundle.

Two other products deserve honorable mention. Cardinal's MVP 192I, with its great warranty ($20 after the first year to extend it to lifetime), 19.2-kbps data speed, and $135 street price, is an excellent value for distributed work groups. The unit's complicated setup kept us from awarding it a Best Buy, but its price-and-performance ratio is hard to beat. Computer Peripherals' Viva 14.4i Internal Modem, aggressively priced at $119, offers terrific ease of use but lacks Windows data comm software.

The Slings and Arrows of Installation

Installing an internal fax-modem may not seem complex at first—just plug in the card, run a cable from the card to your phone outlet, and optionally plug your phone into the card so you can use one line for both voice and data. Sounds simple, eh?

It's not. An internal fax-modem needs a designated COM port and uses an IRQ to communicate with the computer and software. Over 99 percent of the computers sold today already have a COM port installed (which the machine thinks of as COM1), and about 80 percent have a second one (COM2). Many users have a serial mouse plugged into one of the COM ports.

Many fax-modem vendors assume you haven't already dedicated your second port, so their products come with a factory default to COM2—you may have to change this default. The GVC 14.4 kbps Fax Modem assigns COM1 as the default port—quite an illogical assumption, considering that virtually every computer's COM1 is already assigned to a mouse or other device.

Installing these products can be difficult for less experienced users. Documentation often doesn't explain the installation procedure adequately. For example, while the manual for the Zoltrix Platinum Internal 14.4 had some beautiful explanations of COM and IRQ, it fumbled on the one-yard line, with a table that transposed the switch assignments of COM2 and COM3. Such inaccuracies often lead to trial-and-error methods of installation.

Installing these fax-modems can be difficult, thanks to documentation that often doesn't explain the procedure adequately.

Ideally, the installation procedure should have clear instructions, with explanations and illustrations of COM and IRQ settings that you can read on the fax-modem card itself. And the vendor should provide an installation utility that automatically senses which COM ports are occupied and suggests one for your fax-modem card. Of the 23 devices we reviewed, just one—the Intel Faxmodem—met our standards for clear installation instructions. The runners-up in this area were AT&T's DataPort 14.4/Datafax, Boca Research's Boca-Modem V.Fast Class Internal, U.S. Robotics' Sportster 14,400, and Computer Peripherals' Viva 14.4i Internal Modem.

Installation of the 28.8-kbps V.fc fax-modems requires some forethought. These units can outrun some of the newest high-speed computers and cause a veritable core meltdown of the fragile communications driver (COMM.DRV) that Microsoft includes in Windows. And the two external 28.8-kbps models from Hayes and Microcom both require a serial port equipped with a 16550 UART, which enables your system to keep up with their astronomical data speeds. If your PC doesn't already have a 16550-controlled serial port—and about half the

V.34—This Fall's Hot Ticket

Both V.34 and V.fc send and receive data at 28.8 kbps—the fastest uncompressed data speed currently available. But V.34 promises to provide more-reliable high-speed transmissions than V.fc.

First, V.34 is soon to become an official standard approved by the International Telecommunications Union, a committee that is made up of representatives from many modem companies. As a result, V.34's specifications are more rigorously defined than those of V.fc, which reduces the risk of incompatibility among devices from different manufacturers.

The second advantage of V.34 is its technological superiority. V.34 devices will have the ability to test for line conditions both before and during transmission—dynamically adjusting transmission rates as needed.

By the time you read this article, V.34 devices should be available from Motorola, MultiTech, and U.S. Robotics. Street prices for units from these early birds will be relatively high—probably between $400 and $500, according to the vendors' estimates.

You'll save money if you wait a little longer for the second wave of V.34 devices before the end of the year. Best Data, Cardinal, Microcom, Supra, and Zoom all are planning to sell V.34 devices, with street prices starting at $200. PCMCIA fax-modem maker Megahertz also plans to ship a V.34 device this fall; at press time, the company had not set a price.

So why not just buy a V.fc device now and upgrade to V.34 later? Because while all the V.fc devices in this review offer upgrade paths to V.34 for less than $100, you can wait until later this year and buy a V.34 unit without having to bother with an upgrade or pay a premium. Unless you absolutely need a low-cost 28.8-kbps device right now, you're much better off waiting for V.34. • *MultiTech; 612/785-3500.*

—Anita Hamilton

The Compaq Contura Aero At $999.

Take Two, They're Small.

Contura Aero Features

- Only 3.5 lbs
- 486SX/25 Processor
- 4MB RAM (Expandable to 12MB)
- 84MB Hard Drive (170MB available)
- PCMCIA Type II Slot
- 8" Monochrome Backlit VGA Display
- Integrated Compaq EasyPoint™ Trackball
- NiMH Battery Pack and AC Adapter
- WinLink File Transfer Utility with Cable
- Preinstalled MS-DOS,® MS-Windows,™ TabWorks,® Lotus Organizer
- 3-Year Pick-Up Warranty†
- Color Units Available Call for Information

The Compaq Contura® Aero™ is everything a great 486 subnotebook should be. First of all, it's quite small. Only 7.5" wide, 10.25" high, and 1.5" deep. And you'll find it's also very light, a mere 3.5 lbs.

Contura Aero Option Paq
PCMCIA 2400/9600 Data+Fax Modem
3.5" External Floppy Disk Drive
Enhanced Battery Pack-NiMH
Backpack or Carrying Case
Add $319*

But most importantly, the Contura Aero is an incredibly full-featured and useful working tool. It comes with 4MB RAM, an 8" monochrome backlit VGA display, integrated trackball, preinstalled software and more.

For added flexibility, consider the Contura Aero Option Paq.℠ You'll get an additional battery pack, an external floppy disk drive, a PCMCIA data+fax modem, and a carrying case or backpack.

At last. A quality subnotebook with a price proportional to its size.

Contura Aero Upgrades & Options
- Additional 4MB RAM (8MB Total) *Add $245*
- Convenience Base *Add $99*
- 3.5" External Floppy Disk Drive *Add $155*
- Canon BJ-10sx Bubble Jet Printer *Add $269*

COMPAQ DirectPlus

Ask For Our New Free Catalog.

1-800-888-5807
Weekdays 7-7, Sat. 10-4 CST

intel inside

*Price good only with purchase of Contura Aero purchased through Compaq DirectPlus. †Restrictions and exclusions apply. Compaq Aero is covered by a three-year pick-up warranty. Monitors, battery packs and certain options are covered by a one-year warranty. © 1994 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. DirectPlus is a registered service mark of Compaq Computer Corporation. Aero is a trademark and Option Paq is a service mark of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. TabWorks is a registered trademark of Xerox Corporation. The Intel Logo is a registered trademark of Intel Corporation. Offer available in the U.S. only.

Circle 83 on reader service card

Before You Buy a V.fc Modem—A Checklist

Follow these general guidelines if you're converting to a 28.8-kbps V.fc fax-modem and want to feel the wind in your hair on a regular basis.

✓ You should use your fax-modem only on a 486DX-33 PC or better. Overwhelmed systems often freeze up and have to be rebooted.

✓ Either use an internal fax-modem or make sure your external model is connected through a serial port that uses a 16550 UART. About 50 percent of even the high-speed 486DX and Pentium systems sold today use the lower-end 8250 UART, which will almost certainly fail with a 28.8-kbps fax-modem working at its normal speed. You can buy a serial port that's equipped with a 16550.

To see which UARTs your system has, invoke the DOS program MSD (Microsoft Diagnostics) from the directory that DOS resides in. Press C (for COM ports), and the UART type for each port appears near the bottom of the screen. Once you have the right UART installed and running, make sure you include the line COM*x*FIFO = 1 in your SYSTEM.INI file, substituting for *x* the number of the serial port in which your fax-modem is located.

✓ Consider using DOS-based fax and data programs. They often work better at high speeds than those based on the high-overhead Windows environment. If you're committed to Windows, buy a third-party serial port driver to replace the fragile native Windows driver. The most lauded replacements are TurboCom/2 from Pacific CommWare, and the same company's higher-end TurboCommander, which combines the 115.2-kbps drivers with serial diagnostic utilities. • *Pacific CommWare; 503/482-2744.* Reader service no. 789

486 and Pentium systems currently sold don't—you can buy one at any computer store for $65 and up.

You Ain't Doin' Much Without Software

Most performance variables for fax-modems fall into two areas—your software and your phone line, both of which affect data throughput and, far more significant, your productivity. While you can't do much to change the phone lines, you can pick the right software. All the units come with bundled fax software, and all but two have a data communications package. Windows packages are most common, although many modems come with DOS software.

QuickLink II Fax from Smith Micro Software, WinFax Lite from Delrina, and FaxWorks from SofNet are the most common bundled fax packages; QuickLink II Fax and Comit are the most prevalent data communications programs.

Fax Software

All the fax software bundles let you create and send a quick fax memo, add a cover sheet with address information, receive a fax and turn it into a bit-map file in a common (or convertible) format, store frequently dialed fax numbers, and send the same fax to several people in one step. You can also send a fax from within an application, transmit it at a scheduled time, and manage incoming and outgoing fax files by sorting and filtering them.

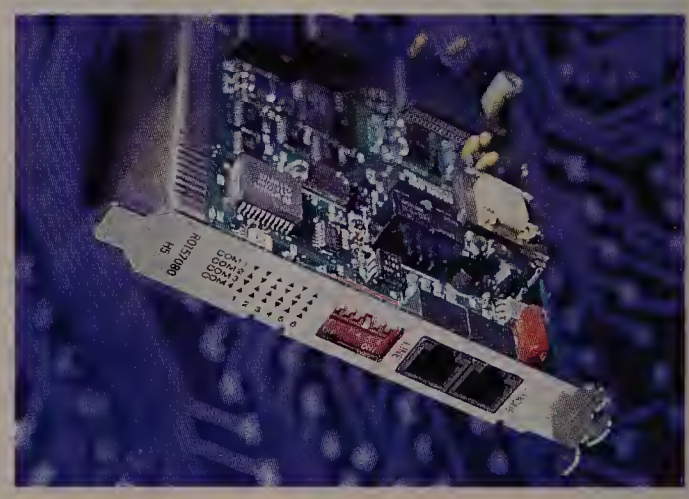
QuickLink II Fax is bundled with the fax-modems from AT&T, Best Data, CMS Enhancements, Computer Peripherals, Practical Peripherals, U.S. Robotics, and Ven-Tel. This package may be the best of the lot for those planning to use both data and fax capabilities. While it is not particularly feature-rich, versions 1.3 and later are easy to use and include the most critical features for handling both fax and data communications.

QuickLink II Fax's interface is set up with large, easy-to-understand buttons that replicate the key features of the menu command set. The program does a good job of keeping the data and fax functions separate. Each has its own phone book, which is fairly easy to set up. The phone books support simple sending groups (for example, click once to send the same fax to a defined set of numbers), but they offer no search function and no multiple-sort capabilities—you can sort only alphabetically by first word.

QuickLink II Fax's fax-management capabilities are rudimentary, but they work, once you get used to the odd naming conventions for the bit-map files. You can view a fax image either from the program, or by using an external module that has its own icon. During transmission, a small window shows your fax's progress. It tells you how much time has passed and flashes LED indicators as though you were using an external fax-modem.

Delrina's WinFax Lite is bundled with the Computer Peripherals, Digicom Systems, GVC, Intel, and Zoom units. WinFax Lite is the junior version of WinFax Pro, the most popular fax program in the world and winner of a Best Buy in August's fax software review. As a dedicated fax program, it has more fax features than QuickLink II Fax. Its smart installation process automatically recognizes which COM port holds a fax-modem. But unless specially configured by the device's manufacturer, it doesn't automatically install the right model; you have to choose this from a list.

Sending a fax and scheduling transmissions is fairly simple with WinFax Lite. Although the array of choices may confuse novices, experienced users will appreciate the added flexibility. An easy-to-understand button-based module, the Administrator, acts as your fax control panel. WinFax's phone books are robust, allowing you to add comments to each name, group names in multiple ways, and import ASCII files.



THE 14.4-KBPS MODEMS, such as the Viva 14.4i from Computer Peripherals, are hot sellers, according to industry analyst Lisa Pelgrim of Dataquest.

Managing unsent and received faxes is straightforward. The program's list of one-line abstracts will usually suffice, but you can attach additional details by double-clicking an entry. While WinFax Lite is a

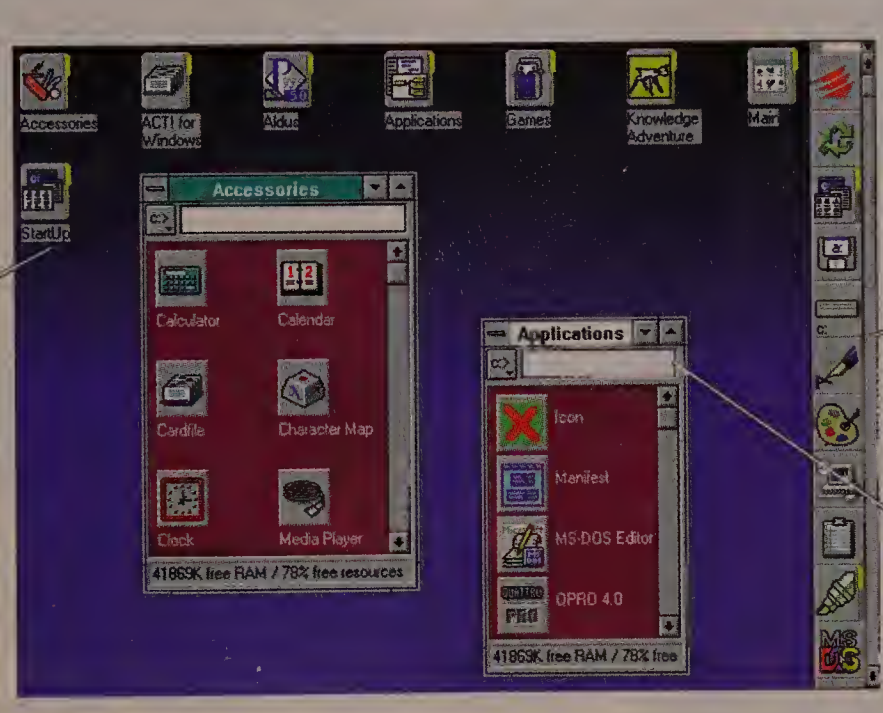
WONK

SideBar Wonks Your Windows to Perfection

SideBar eliminates the last bit of DOS clunkiness from MS Windows.

Object-oriented interface makes it easier to manage files, disk drives and printers.

Simply drag and drop files to copy, move or print them.



Now opening, copying, moving, deleting, renaming and printing are intuitive.

Speed up the way you work by customizing SideBar to conserve desktop space.

Sometimes prefer to key-in DOS commands? The command line's always there.

SideBar is the efficient desktop for Windows—a small, fast shell that automatically creates objects that make it simpler to manage applications, documents, folders, drives, TSRs, printers, etc. All you need to do is point and click.

SideBar simply makes Windows more 'windows-like.' And that makes your work go quicker and easier. It's an idea incorporated in Microsoft Office, but we've taken it to its obvious conclusion.

SideBar makes MS Windows a better place to work.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (310) 392-9851 Fax (310) 314-4219
Quarterdeck International Ltd., B.I.M. House, Crofton Terrace, Dun Laoghaire Co. Dublin, Ireland Tel.(353) (1) 284-1444 Fax: (353) (1) 284-4380

©1993 Quarterdeck Office Systems. Trademarks are property of their respective owners.

Circle 189 on reader service card

Online Services Edge Into the 14.4-kbps World—Slowly

You thought you'd be able to race along the information superhighway—but think again. At press time, only CompuServe had a significant number of 14.4-kbps connections for subscribers. Here's what the rest of the services offer, and what they plan in the coming year:

America Online (AOL)

AOL has 9600-bps access almost nationwide and plans to have limited 14.4-kbps service by the end of the year. • *America Online; 800/827-6364.* Reader service no. 801

CompuServe

At press time, this giant offered 14.4 kbps in over 70 locales, including most major metropolitan areas. Normal connection is at 9600 bps; users can connect at 2400 bps without a surcharge. • *CompuServe; 800/848-8990.* Reader service no. 802

Delphi Internet Services

Delphi's normal connect speed is 9600 bps; callers in the Boston area can connect at 14.4 kbps. By early fall, Delphi expects to have 14.4-kbps service in New York, Los Angeles, Chicago, and Atlanta. • *Delphi Internet Services; 800/695-4005.* Reader service no. 792

GEnie

GEnie's customers are split between 9600 bps and 2400 bps. The company claims to be looking into higher-speed connections, but won't commit to any specifics. • *GEnie; 800/638-9636.* Reader service no. 793

MCI Mail

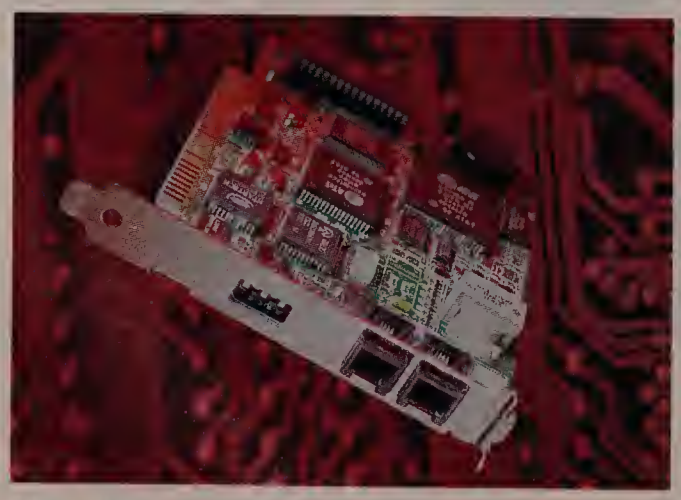
Unlike most services, MCI Mail charges by the byte, so high-speed connections won't shrink your bill. The highest connect speed available to most users is 9600 bps. • *MCI Mail; 800/ 444-6245.* Reader service no. 794

Prodigy

Prodigy offers about 90 percent of its users 9600-bps lines. The company expects to introduce 14.4-kbps lines this year in certain areas yet to be specified. • *Prodigy; 800/776-3449.* Reader service no. 804

good offering, serious fax users will probably want to upgrade to Delrina's higher-end WinFax Pro.

FaxWorks, the ease-of-learning champ from SofNet, comes bundled with the fax-modems from ATI, Boca Research, Cardinal, Data Race, Hayes (the Accura 144B +), and Microcom. The more advanced version, FaxWorks Pro, won a Best Buy in our August review of fax software. But ease of learning doesn't necessarily imply ease of use—you may figure out this product more quickly than the others, but it isn't any simpler to use on a daily basis.



MODEMS THAT ARE CAPABLE OF transmitting data at 19.2 kbps, such as this ATI 19200 ETC-I device, are called V.32terbo modems.

FaxWorks has the most intelligent installation process of all the programs: It not only tries to find out which port the fax-modem is on, but it attempts to identify the make of the device and checks the phone line for a dial tone. FaxWorks' detailed setup screen may send users to the product's excellent online help.

FaxWorks' "cue cards"—informative pop-up descriptions of functions—make sending a fax easy. Whenever your mouse cursor rests momentarily over an action area (such as a button), a big, colorful cue card pops up. It's easy and straightforward to schedule or repeat a fax transmission, though there's no simple way to edit an existing fax to send to another person. And FaxWorks' phone books conveniently let you enter many details.

The package really shines in adding annotations, such as lines, circles, rectangles, and text, to a fax. The built-in viewer function contains all the drawing tools you'll need, so you can receive a fax, mark it up, and send it back in minutes. FaxWorks also has a gray-scale display option that makes faded transmissions more readable.

FaxTalk, from Thought Software, comes with the Motorola and Supra. It's a solid package with good documentation that makes it relatively easy to use. Bit Software's BitFax, which comes with the Zoltrix model, is rather ordinary. While it competently does everything the other programs do, neither its interface nor its documentation are particularly good. BitFax's higher-end counterpart, BitFax Professional for Windows (reviewed in August's fax software review), is a solid upgrade.

Hayes's SmartCom Fax, bundled with the Hayes Accura 28.8 V.FC + Fax in this review, gives you excellent tools to improve the readability of incoming faxes.

Data Communications Software

For data communications, Tradewind Software's Comit competes with QuickLink II Fax as the most common offering. It's bundled with devices from ATI, Boca Research, Cardinal, Data Race, GVC, Intel (Faxmodem only), Supra, and Zoom. Comit is an unintimidating and fairly easy-to-learn program that makes data communications as reliable as possible. It comes with the usual features—such as phone and configuration lists and the ability to alter settings—and its data communications features are better than those found in QuickLink II Fax.

Hayes's Smartcom LE is a serviceable product with basic online and BBS features. Mustang Software's DOS-based Qmodem, bundled with the Digicom Connection 14.4 DF, is designed for experienced modem users. If you're not interested in learning modem configurations, you'll want to avoid it. But if you're willing to learn, you'll find Qmodem a highly reliable package that can get you working faster than the more user-friendly Windows offerings.

DCA's Crosstalk Communicator for DOS

THE FIRST RULE OF WINDOWS IS REAL ESTATE, REAL ESTATE, REAL ESTATE.

The 20", 1280 X 1024, Non-Interlaced SAMPO AlphaScan LC Color Display Now Available At The Competition's 17" Price

It's twenty inches of high res, high powered Windows performance that lets you make the most of your display real estate. How does SAMPO do it? It's easy when you're already building corporate grade displays for some of the world's largest workstation manufacturers.

The New SAMPO AlphaScan LC is 100% VESA compliant, and compatible with virtually all Super VGA graphic controllers and autosyncs up to 1280 x 1024, non-interlaced resolution. Rich color saturation, sharp text and graphics, ergonomic control features, and big screen real estate, make the SAMPO AlphaScan LC ideal for Windows, as well as CAD and publishing.

If you demand the most from your display systems and your budget; just compare our product to their product, our specs to their specs, or, if that isn't convenient, compare the image in our ad to the image in theirs. The difference is obvious.

Finally, compare their price to our fiercely competitive SAMPO price. You'll choose SAMPO.

Make the SAMPO choice at a dealer near you today.

SAMPO
AMERICA
Corporate Grade Displays for Business

(404) 449-6220 FAX: (404) 447-1109

Dealers and Distributors call (800) 828-6344, ext 702, product code 1013 for free phone or fax product information.

Circle 255 on reader service card

is bundled with Intel's SatisFaxtion Modem/400. It offers a few aesthetic bells and whistles (literally—you can have it play Beethoven's Fifth as an alarm), but it's no piece of cake to learn. Still, Crosstalk is more programmable than other comm packages—an ability you'll appreciate over time.

Modems to Go

Notebook users, despair not: You have plenty of options. The portable cousin of the internal desktop model is a PCMCIA fax-modem card, and the external equivalent is the pocket fax-modem. There are 28.8-kbps V.fc pocket units, and many 14.4-kbps pocket and PCMCIA fax-modems.

As its name implies, a pocket fax-modem can fit into your pocket and weighs less than a pound. Pocket units are durable and travel well, but require external power. Several companies in this comparison sell pocket fax-modems: Boca Research, Computer Peripherals, Megahertz, and U.S. Robotics all offer 14.4-kbps units with street prices in the $240 to $340 range, and Microcom and Practical Peripherals sell 28.8-kbps models from about $400 on the street.

The early promise of PCMCIA has been darkened by its fragility and compatibility problems: Standard PCMCIA cards don't all work in manufacturers' standard slots, and the cards often fail. PCMCIA fax-modems compound the fragility concerns, because the connection between the credit-card–size fax-modem and the wall socket is tenuous. But people will trade these problems for PCMCIA's terrific portability. You can buy a 14.4-kbps PCMCIA card from Boca Research, GVC, Hayes, Intel, Megahertz, Motorola, Supra, Ven-Tel, or Zoom for a street price of $250 to $300. Smart also plans to sell a 28.8-kbps V.34 PCMCIA card for a street price of $425, to be available by the time you read this article. • *Megahertz; 800/527-8677.* Reader service no. 796 • *Smart Modular Technologies; 800/536-1231.* Reader service no. 797

Performance: Not by the Numbers

To test performance and data compression on each class of fax-modem (14.4, 19.2, and 28.8 kbps for data; 14.4 and 19.2 kbps for fax), we sent five types of data files and two types of fax transmissions across normal phone lines. The 28.8-kbps devices transferred data at a rate about twice as fast as that of the 14.4-kbps units, and the 19.2-kbps devices were about 20 percent speedier than the 14.4-kbps units. Actual throughput depended on the type of file sent; database files (in dBASE format) were the most compressible, followed by text files, executable files (in DLL format), image files (in TIFF), and ZIP files. Since ZIP files are already compressed, the modems were unable to compress them much further.

Our tests showed that the most successful compression occurred with the 14.4-kbps devices, which compressed files down to as little as one-quarter of their original size, depending on the type of file (in some cases compression did not change file size at all). At maximum compression, the 19.2-kbps devices squeezed files to one-third their original size, and the 28.8-kbps units to just under one-third. The fastest effective throughput, which we attained sending a dBASE file on a 28.8-kbps device, was just 80 kbps—nearly one-third slower than the 115.2-kbps peak speeds (four-to-one compression) claimed by many vendors of 28.8-kbps fax-modems.

As for fax capabilities, the 14.4-kbps units took 1 minute to send either one and a half pages of text or one page of mixed text and graphics. The ATI 19200 ETC-I is the only unit we tested that can send faxes at 19.2 kbps, which translates into 2.1 pages of text per minute, according to our tests.

THE 28.8-KBPS V.FC DEVICES, such as this Hayes Accura, face some stiff competition from the new V.34 devices that are just hitting the market.

We also conducted informal tests to see whether these devices could reliably achieve their claimed data speeds in real-world situations. To test data transmission on the 14.4-kbps models, we logged on to a local BBS that supports that speed. For the 19.2-kbps and 28.8-kbps models, we made long-distance calls into *PC World* BBSes set up at those speeds. While all the 14.4-kbps units connected at their claimed speeds, results on the 19.2-kbps and 28.8-kbps devices were inconsistent. Of the six 28.8-kbps units, four connected at 28.8 kbps and two at 21.6. The 19.2-kbps ATI connected to our 19.2-kbps BBS at just 14.4 kbps, but the 19.2-kbps Cardinal Technologies unit lived up to its claimed speed.

One reason for the varying performance among both the 19.2-kbps and 28.8-kbps units is the inconsistent matchup of configuration options. If different modems are configured to take advantage of different features, they may not always work together at their highest speed.

In all fax-modems, the software sends a message, called an *initialization string*, that configures how the modem establishes connections with other modems. Software designers show varying levels of aggressiveness in what they put into the initialization strings. Some simply use the factory defaults, while others configure every aspect of communications.

If you think your initialization string may be causing a performance problem, call the fax-modem maker's tech support line for an alternative string. If you think the problem lies in the configuration of the modem at the other end, ask its owner how it's configured and try to match your configuration settings to those. A warning, however: Implementation of the standard Hayes command set varies, so an identical command set sent to two modems can result in different configurations.

There are other reasons you may not obtain vendors' claimed speeds on 19.2-kbps and 28.8-kbps devices. For example,

Save over $500
Limited-time* bundle offer.
Get a PanelBook 550 with a GyroPoint™
wireless mouse & other valuable products and save.

PANELBOOK. ISN'T IT AMAZING THAT SOMETHING SO SMALL CAN MAKE YOU COME ACROSS SO BIG?

New portable LCD projection for more effective presentations. PanelBooks™ are the most portable LCD panels you can buy—up to 40 percent smaller than others. Yet they can make you a huge success.

Designed to work side-by-side with most any notebook computer, you just set a PanelBook on an overhead projector. You'll instantly project what's on your computer screen to an entire room full of people. Giving you all the brilliant color and impact of today's software.

And there are lots of PanelBooks to choose from. Including active-matrix panels for data and video, very affordable portable panels, and our new 1024x768 PanelBook 750 for demanding high-resolution applications. Plus, only In Focus Systems can give you LiteShow.™ An incredibly easy-to-use built-in electronic slide system that lets you project without a computer.

As the world leader in color LCD projection, In Focus Systems provides PanelBook solutions to fit any application. Not to mention any briefcase.

InFocus® SYSTEMS

Great ideas. Brought to light.™

Call 1·800·294·6400 for the details of our limited-time money-saving bundle offer.

BPBS03 ©1994 In Focus Systems, Inc. Phone (503) 692-4968 Fax (503) 692-4476. In Europe: Phone 31 (0) 2503 23200 Fax 31 (0) 2503 24388. In Focus Systems is a registered trademark, and PanelBook and LiteShow are trademarks of In Focus Systems, Inc. All other products are trademarks of their holders. *While supplies last.

Circle 132 on reader service card

FEATURES COMPARISON

Low-Cost Fax-Modems: A Myriad of Choices

● Yes
○ No
n/a = not applicable

	ATI 19200 ETC-I	BEST BUY AT&T DataPort 14.4/Datafax	Best Data Products The Smart One 1442F	Boca Research BocaModem V.Fast Class Internal	Cardinal Technologies MVP 192I	CMS Enhancements FM-144HVbis	Computer Peripherals Viva 14.4i Internal Modem	Data Race RediCard	Digicom Systems Connection 14.4 DF	GVC 14.4 kbps Fax Modem
Standard features										
Type	internal	internal	internal	internal	internal	internal	internal	internal	internal	internal
External model available	●	●	●	●	●	○	●	●	○	●
Estimated street price as of 5/1/94	$199	$149	$118	$229	$135	$169	$119	$189	$110	$129
Speed										
Fax (kbps)	19.2	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
Data (kbps)	19.2 V.32terbo	14.4	14.4	28.8 V.fc	19.2 V.32terbo	14.4	14.4	14.4	14.4	14.4
Bundled software										
DOS										
Fax	none	QuickLink II Fax	QuickLink II Fax	FaxWorks	FaxWorks	QuickLink II Fax	QuickLink II Fax	FaxWorks	none	DOSFax Lite
Data	none	QuickLink II Fax	QuickLink II Fax	Comit	Comit	QuickLink II Fax	QuickLink II Fax	Comit	Qmodem	Comit
Windows										
Fax	FaxWorks	QuickLink II Fax	QuickLink II Fax	FaxWorks	FaxWorks	none	WinFax Lite	FaxWorks	WinFax Lite	WinFax Lite
Data	Comit	QuickLink II Fax	QuickLink II Fax	Comit	Comit	none	none	Comit	none	Comit
Upgradability										
Software	○	○	○	○	○	○	○	○	●	○
Hardware	○	●	●	●	○	○	○	●	○	○
Replacement	○	●	○	○	○	●	●	○	○	○
Fax operation class										
Class 1	●	●	●	●	●	●	●	●	●	●
Class 2	○	●	●	●	●	●	●	●	○	●
Service and support										
Warranty (years)	5	lifetime	5[1]	5	lifetime[2]	1	5	5	5	5
30-day money-back guarantee	○	●	●	○	○	○	○	○	○	○
Toll-free technical support	○	●	●	○	○	●	○	●	○	○
Weekday support hours	9a.m.–7p.m. ET	8a.m.-8p.m. ET	8a.m.-5p.m. PT	8a.m.-6p.m. ET	8a.m.-5p.m. ET	8a.m.-5p.m. PT	7a.m.-5p.m. PT	9a.m.-6p.m. ET	7a.m.-6p m. PT	9a.m.-5p.m. ET
Weekend support	○	○	○	○	○	○	○	○	○	○
Average turnaround on repairs (days)	5	3	3	1 to 2	5	3	3 to 5	1 to 2	10	7
Contact	905/882-2600	800/482-3333	800/632-2378	407/997-6227	717/293-3000	800/788-4267	800/854-7600	800/749-7223	800/833-8900	800/289-4821
Reader service number	641	642	643	644	645	646	647	648	649	650

[1] Two-year warranty can be extended to five years for $29.95.

[2] One-year warranty can be extended to lifetime after first year for $20.

[3] 30-day money-back guarantee available only if modem is purchased direct from Supra.

you may not get the speed that you paid for if you install the fax-modem without reading the instructions on how to configure it for the highest performance. Even if you do follow the configuration instructions, you may still end up in that situation, because the manufacturer didn't configure the bundled software before shipping it out. This lack of customization is unfortunately the industry norm rather than the exception.

Most bundled software requires you to tell it during installation what kind of fax-modem you have. The Practical Peripherals PC144HC and the CMS Enhancements FM-144HVbis, which are both 14.4-kbps devices, ship with software that assumes you have a 2400-bps fax-modem. If you buy these devices, make sure that you change the default setting, or your transmissions will be very slow.

The external models from Hayes and Microcom pumped data at a rate that overwhelmed the Austin 486-66 PC we used as a test machine in our informal testing. The results were frequent freeze-ups in Windows and occasionally even in DOS-based software. (These happen more often in

	Hayes Accura 144B + fx144	Hayes Accura 28.8 V.FC + Fax	BEST BUY Intel Faxmodem	Intel SatisFaxtion Modem/400	Microcom DeskPorte Fast ES 28.8	Motorola UDS FasTalk II 14.4	Practical Peripherals PC144HC	Practical Peripherals PM288HC II	Supra FaxModem 288i	BEST BUY U.S. Robotics Sportster 14,400	Ven-Tel PCM144Fax	Zoltrix Platinum Internal 14.4	Zoom Fax VFP 28.8
	internal	external	internal	Internal	external	internal	internal	internal	internal	internal	internal	internal	internal
	●	n/a	●	●	n/a	●	●	●	●	●	●	●	●
	$150	$300	$129	$285	$259	$178	$200	$260	$269	$119	$200	$139	$219
	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
	14.4	28.8 V.fc	14.4	14.4	28.8 V.fc	14.4	14.4	28.8 V.fc	28.8 V.fc	14.4	14.4	14.4	28.8 V.fc
	none	none	DOSFax Lite	Faxability	none	FaxTalk	QuickLink II Fax	QuickLink II Fax	FaxTalk	QuickLink II Fax	QuickLink II Fax	BitFax	DOSFax Lite
	none	none	Comit	Crosstalk Communicator	none	none	QuickLink II Fax	QuickLink II Fax	Comit	QuickLink II Fax	QuickLink II Fax	BitCom	Comit
	FaxWorks	Smartcom Fax	WinFax Lite	Faxability Plus	FaxWorks	FaxTalk	QuickLink II Fax	QuickLink II Fax	FaxTalk	QuickLink II Fax	QuickLink II Fax	BitFax	WinFax Lite
	Smartcom LE	Smartcom LE	Comit	none	none	none	QuickLink II Fax	QuickLink II Fax	Comit	QuickLink II Fax	QuickLink II Fax	BitCom	Comit
	○	○	○	○	○	○	○	○	○	○	○	○	○
	○	●	○	○	●	○	○	●	●	○	○	○	●
	○	●	○	○	○	○	○	○	●	○	○	○	○
	●	●	●	○	●	●	●	●	●	●	●	●	●
	○	○	●	○	○	●	●	●	●	○	●	●	●
	5	5	5	5	5	2	lifetime	lifetime	5	5	5	5	7
	●	●	●	●	○	○	●	●	○[3]	●	○	○	○
	●	●	○	○	○	●	○	○	●	○	●	○	○
	8a.m.-6p.m. ET	8a.m.-6p.m. ET	8a.m.-5p.m. PT	8a.m.-5p.m. PT	8a.m.-7p.m. ET	7a.m.-6p.m. CT	8a.m.-11p.m. PT	8a.m.-11p.m. PT	8a.m.-4:30p.m. PT	8a.m.-6p.m. CT	8a.m.-5p.m. PT	8a.m.-5p.m. PT	9a.m.-11p.m. ET
	○	○	○	○	○	○	8a.m.-5p.m. PT	8a.m.-5p.m. PT	○	○	○	○	9a.m.-5p.m.[4]
	1	1	10	10	1	7	1	1	3	2 to 5	7 to 10	4	7
	404/441-1617	404/441-1617	800/538-3373	800/538-3373	800/822-8224	800/451-2369	800/442-4774	800/442-4774	800/727-8667	800/762-6163	800/538-5121	510/657-1188	800/666-6191
	651	651	652	652	653	654	655	655	656	657	658	659	660

[4] Saturday hours only.

For more information about all products in this table, circle reader service no. 906.

Windows because it demands more of the CPU's attention than DOS does, and the processor can't always keep up.) Surprisingly, this occurred much less frequently with the internal models, although all had at least one Windows freeze-up.

Finally, speed isn't always measurable in actual transmission rates. The Intel SatisFaxtion Modem/400 has its own microprocessor and memory to take on computing tasks that the CPU would normally handle, such as converting graphics and text to bit maps. While the $285 SatisFaxtion board costs more than the other 14.4-kbps units, it returns control of your computer to you faster and handles data buffering better, so you get improved throughput when sending and receiving faxes.

Making Your Modem Last a Little Longer

The vendors in this review offer three different kinds of upgrades: a hardware upgrade, in which you send your fax-modem back to the manufacturer to have a chip or two changed; a software upgrade, in which you download new capabilities to the device's memory; or a trade-in, in which the manufacturer takes back your fax-modem

PC WORLD TEST CENTER REPORT

dBASE and Text Files Compress Best, Move Fastest

Data throughput (kbps)

Modem type	Text	dBASE	ZIP	TIFF	DLL	Average
V.fc 28.8	60.1	80	30.9	45	45.2	52.2
V.32terbo 19.2	38.1	54.9	20.7	27.2	29.4	34.1
V.32bis 14.4	29	56.1	15.7	20.5	22.2	28.7

Methodology We selected two modems from each class and installed them in a pair of Compaq Deskpro/i 486DX2-50 computers. Under normal telephone-line conditions, we measured the time required to transfer a series of files using V.42bis compression (up to 4:1) and Procomm Plus for Windows' Zmodem protocol. We set DTE rates to 115.2 kbps (DTE represents the serial connection between a computer and its modem).

Fax throughput (pages per minute)

Modem type	Formatted text	Formatted text and graphics
19.2 kbps	2.1	1.3
14.4 kbps	1.5	1
9600 bps	0.9	0.6

Methodology For each test, except the 9600-bps test (in which the receiving unit was a conventional fax machine), we installed two fax-modems in a pair of Compaq Deskpro/i 486DX2-50 computers. Under normal phone-line conditions, we measured the time required to transfer a high-resolution (200-dpi) image of a two-page Word for Windows document, using WinFax Pro. The first page consisted mainly of formatted text, and the second page was three-quarters formatted text and one-quarter graphics (a chart).

and gives you a discount on a new model.

You can upgrade about half the models we reviewed in some way; all the V.fc devices can be upgraded to the V.34 standard with hardware that costs less than $100. But having to return your old fax-modem to get a replacement—as is required for the CMS, Computer Peripherals, Hayes Accura 28.8 V.FC + Fax, and Supra units—can be unappealing because of the downtime you'll face while waiting for the new model. Hardware upgrades that can be done only at the factory present the same problem; either option may deprive you of your fax-modem for a week or more.

Microcom has an interesting upgrade for do-it-yourselfers. For $39, the company sends the new chip, a chip-removal tool, and a floppy disk—everything you need to upgrade its fax-modem. And Supra offers a fast exchange with no downtime: You give the company your credit-card number as a deposit, it sends you a new fax-modem, and you send the old one back. Digicom has the most attractive upgrade option of all: You can upgrade its Connection 14.4 DF to V.32terbo capability with an upgrade disk for $39.95—the software is not complicated, and it works. Still, it's a better deal, and much simpler, just to buy the $135 Cardinal V.32terbo unit.

At Last, a Pleasant Surprise

Service and support policies are important for any product, but they're even more critical for fax-modems, because communications is an area in which users frequently need help, especially when it comes to installation. Unless you or someone in your office has telecommunications or modem expertise, you'll want your fax-modem vendor to offer strong technical support.

A five-year warranty is pretty standard for most fax-modems, but Zoom gives seven; and AT&T, Cardinal, and Practical Peripherals offer lifetime coverage. Motorola provides just two years, while CMS offers a measly one year of coverage. AT&T, Best Data, Hayes, Intel, Practical Peripherals, and U.S. Robotics all offer 30-day money-back guarantees.

Most vendors provide technical support for 9 to 11 hours a day, weekdays only. Exceptions are Practical Peripherals and Zoom, which offer longer hours and weekend support. The specific times are more critical than the sheer number of hours. All else being equal, look for a vendor in your time zone, since its hours are more likely to overlap with yours. If you start your workday early, consider a vendor in an eastern time zone; if you work late, you may want one in a western time zone. Toll-free support lines are rare these days—only AT&T, Best Data, CMS, Data Race, Hayes, Motorola, Supra, and Ven-Tel offer them.

With Windows 4.0, also known as Chicago, and Plug and Play—Microsoft's new procedure for installing Windows peripherals—due out by the end of the year, modem installation promises to be simplified immensely. With luck, you will never again have to call your modem maker's tech support lines in confusion and despair. But until these promises come to fruition, make sure you buy from a company that gives you the support you're sure to need.

Jeffrey Gordon Angus is a management and computer consultant based in Seattle, Washington. Martin Marshall, a writer and product usability consultant, and Anita Hamilton, an assistant editor for PC World, *also contributed to this article.*

EXPLORE the INTERNET!

FREE

DELPHI is the only major online service to offer you full access to the Internet. And now you can explore this incredible resource with no risk. You get 5 hours of evening/weekend access to try it out for free!

Use DELPHI's Internet mail gateway to exchange messages with over 20 million people at universities, companies, and other online services such as CompuServe and MCI Mail. Download programs and files using **FTP** or connect in real-time to other networks using **Telnet.** You can also meet people on the Internet. **Internet Relay Chat** lets you "talk" with people all over the world and **Usenet News** is the world's largest bulletin board with over 4500 topics!

To help you find the information you want, you'll have access to powerful search utilities such as "Gopher," "Hytelnet" and "WAIS." If you aren't familiar with these terms, don't worry; DELPHI has hundreds of expert online assistants and a large collection of help files, books, programs, and other resources to help get you started.

Over 600 local access numbers are available across the country. Explore DELPHI and the Internet today. You'll be amazed by what you discover.

FIVE HOUR FREE TRIAL!

Dial By Modem 1-800-365-4636, Press return until you get a prompt
At Username, enter JOINDELPHI. At Password, Enter PCW948

Offer applies for new members only. A valid credit card is required for immediate access.
Other restrictions apply. Complete details are provided during the toll-free registration.

Attention Current Internet Users: See what DELPHI can offer you! Stock quotes, Grolier's Encyclopedia, newswires, and hundreds of other services are just a few keystrokes away. Telnet to delphi.com and enter the username and password above for a free trial.

DELPHI
INTERNET

Questions? Call 1-800-695-4005.
Send e-mail to INFO@delphi.com

Circle 49 on reader service card

Average Annual Total Return
DOW JONES
CHANGES UP
NASDAQ
Stocks
AMEX
Bonds
4.83%
29.50
6.37%
24
13
18
16

15 Ways to Leave Your Broker

SHOULD YOU INVEST BY PC? WE TESTED A BATTERY OF SOFTWARE AND ONLINE SERVICES. WE TALKED TO AMATEUR INVESTORS. WE CONSULTED PROFESSIONAL BROKERS AND FINANCIAL EXPERTS. HERE'S OUR ADVICE.

By Naomi Wise

Whether it's large or small, we've all got a nest egg we're looking to grow into a retirement fund big enough to support us in the golden years. We all want a richer return on our savings than the measly interest offered by a savings account or CD. But how do you sort out the options? And how do you keep track of your financial empire to make sure you don't wind up living on a park bench?

In the past, you had few options: You could take advice from a full-service—read expensive—broker or financial planner, or you could listen to your brother-in-law Bernie's counsel on mutual funds. But now you have an additional choice: your computer. Software programs suited to every level of investor, from the bewildered beginner to the hotshot hobbyist, are replacing or supplementing the services of brokers—not to mention old big-mouth Bernie.

There are software packages to manage every aspect of your finances—programs that track your monthly finances, offer expert investment advice, help plan investment strategies for retirement, research specific investment prospects, and keep up with changing financial news and prices. If you're ready to buy and sell yourself, you can modem your order directly to discount brokers for rock-bottom prices. (See "Picking the Right Investment Tool.")

To find out how good a financial adviser the computer is, we spoke to dozens of people who use a variety of financial programs. We also spoke with professionals to learn whether they thought these "amateurs" were utterly mad to risk their money without guidance—or if they were worried about losing their jobs.

Some of the investors we spoke to were heads of families, taking pains to build up college and retirement funds. Some were retirees having fun with their adrenal glands. Several were high-stakes players using analysis programs to compete against the market, and a few could be called users in the addictive sense, filling their empty hours with stocks and software.Whatever their investment motives and strategies, most of them had lost at least a little money in the market swoops of last spring, but not one was ready to entrust everything to a broker. Some couldn't afford the fees, but those who could didn't see any reason to spend the money.

Of course, there's still no program that offers infallible soothsaying and hence a guarantee of success. Given this crucial deficiency, most of the investors we spoke with devote a lot of time

to research. The computer helps, though, by doing the sort-and-find, track-and-calculate, record-keeping scutwork—leaving the humans free to follow the financial news.

Building an Empire on GI Pay

David Sawyer is a soft-spoken Army officer stationed in Puerto Rico. Before starting to invest and buying the software to help, Sawyer studied financial magazines, investment newsletters, and the financial programs on CNN—research he continues. "I want to know everything I can," he says, "or I might end up losing a lot of money. I can't afford that." Supporting a wife and two children on GI pay of less than $25,000 a year, he has over $20,000 invested.

Twice a week, Sawyer boots up Wealth Builder (Reality Technologies/Reuters

News Service), a household money manager with asset allocation and an add-on for downloading stock quotes from Reuters News Service. Asset allocation helps you get the right mix of investments based on your age and goals—taking inflation into account. "It gives me a picture of my future," says Sawyer. "I have a daughter and a son and I've got their college educations plugged in, plus my goals for my military retirement—and a house and new car."

Wealth Builder is one of several affordable money managers (others include Quicken and Managing Your Money). These packages can do double duty: As portfolio managers, they keep track of investments, and they also advise how much to allocate to which types of stocks and bonds. Some have add-on modules that access financial databases for current stock prices and company histories. Though many of the investors we spoke with use money managers for portfolio tracking, they choose dedicated programs to get information, help them make decisions, and trade online.

Walter Kaatz uses a number of financial shareware programs along with online brokerage accounts to manage and track his investments, all feeding into Quicken. An ex-actor, he now runs his family's wholesale plumbing supply business near Detroit. Before he bought a computer, Kaatz used the *Wall Street Journal* to track his investments. "It was always a pain," he remembers. "Math is not my strong point."

Four years ago, he simultaneously started a family and bought a PC—and discovered a new side of himself. He now spends 20 minutes to an hour a day downloading stock prices from CompuServe, getting quotes from Prodigy, and trading through two online brokerage accounts. His favorite program is a shareware portfolio manager called Capital Gainz that can calculate the real (after-tax, after-inflation) value of his holdings. He spends additional time consulting financial magazines and investor forums—without trusting the latter entirely. "You don't know if the people [in forums] are experts or not," he cautions. "Anybody can say anything on a bulletin board."

If you value your time, you don't want to download stock prices without a sieve. "I have a friend who downloads the entire stock market every day, by satellite," Kaatz observes. "He's got two dishes, two or three computers, and two monitors on his patio. He owns only about 20 stocks, but it takes him 6 hours to download."

The Software Sieves

"One of the things the computer will do," says Frank Gaylord, a retired broker in Lakeville, Minnesota, "is take the same data in the newspaper, and sort it. It does things any person can do, but does them much faster." Not only can you get information about your investments every time you log on, but a filter helps you find new investments that meet your specifications.

"The way to make money is to buy quality and stick with it," says financial planner Janet Kratz.

Gerald David Kelly, a Baltimore-area postal supervisor, uses Morningstar software to identify mutual funds that meet his conservative criteria for high safety, consistency of returns, and experienced managers with their own money in the funds. His approach is relaxed but alert: "I follow the market in the paper," he says. "I only make changes when I hear something new." Investing $200 a month, he's built his accounts to $63,000 over seven years. "Pretty good, huh? As my mother used to say, it's just a matter of keeping your eye on the fry."

Many investors also turn to online discount brokers' programs such as FOX from Fidelity, StreetSmart from Schwab, and Reality's Smart Investor Network from *Money* magazine. These provide graphs, charts, and the latest quotes; it's up to you to figure out what they mean. Such software's primary purpose, though, is to let you modem your order to the brokerage house at 3 a.m. (if you can't sleep until you've chucked your sagging shares of BugWare Chip and Dip, NYSE).

Marc Salzberg, a Broadway stagehand, combines online brokerage software with an online network program that offers filtered news and historic-performance downloads,

JAMES SCHNEPF

analysis, and portfolio management—and feeds them all to a money manager. Salzberg started using Quicken as a checkbook manager six years ago. When his daughter was born, he bought some stock from his brother-in-law the broker (not a Bernie but a Merrill Lynch pro). He soon realized that as "a little person" (with about $50,000 currently invested) he couldn't afford the commissions on an active full-service account, so he chose a FOX (Fidelity) online trading account instead.

"It's essentially an automated broker, and you get a 10 percent discount," he says. "It updates prices, keeps track of all your trades, and gives you an immediate record, so you don't have to wait for your monthly statement." Salzberg tried Quicken Companion's investment features, but he found the relatively rudimentary filtering and customizing capacities too cumbersome, especially after he compared them with his one-month, low-priced trial of Morningstar. Since last April, he's been using Reuters Money Network for Quicken Users. "It gives you all the information and news and historical prices, and it can filter automatically to the companies you're interested in," says Salzberg. "There's *so* much data—a newcomer on CompuServe can be overwhelmed."

Theaters are littered backstage with financial and computer magazines, Salzberg says. He reads them avidly. For him, his software's greatest benefit has been to increase his understanding, so that he can now choose investments more wisely. "It's really helped me see what I'm doing, to see my mistakes, because the programs let me see my portfolio as a whole."

Between Flirtation and Obsession: Fundamental and Technical Analyses

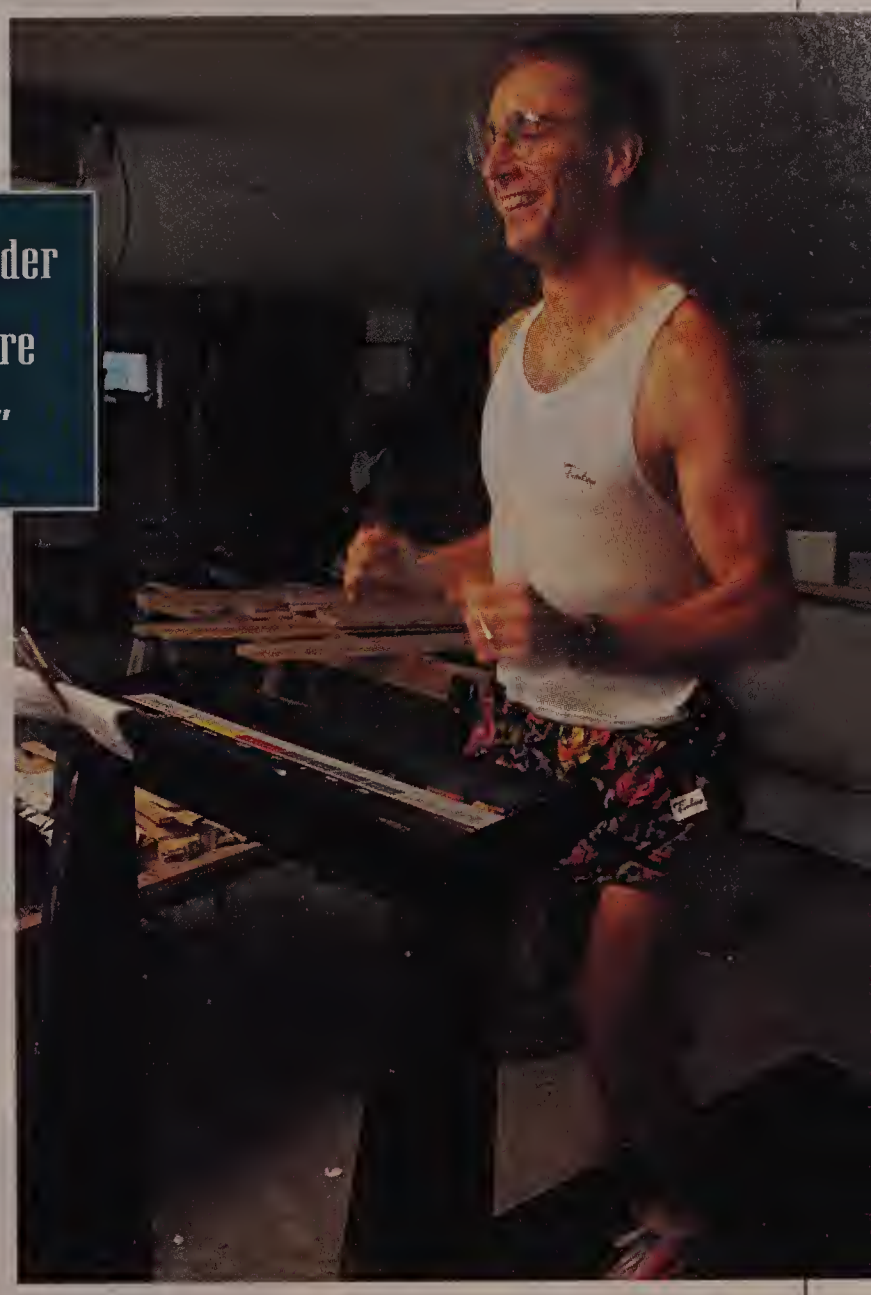
Most of the filter programs are based on a tool called *fundamental analysis*. They chart the historical performance of a company—for instance, how high its dividends have been during the last three, five, and ten years. This is a typical approach for long-term, conservative investors like Janet Kratz of Wisconsin, a professional financial planner. "The way people really make money is to buy quality and stick with it," she says. "You can't change your strategy as the market changes, because you'll always be changing after the market changes." She uses Quant IX, a program several investors praised for its ease of use and minimal memory requirements; it offers fundamental analysis and portfolio management.

There's another type of analysis, however, that appeals mostly to active, short-term traders, especially those who get so enraptured that they invest as much for thrills as for money. *Technical analysis* looks at the performance of the stock, not the company—and graphs it moment by moment to determine the right instant to buy or sell. "You don't know what's going on, but if a stock suddenly goes way up, that gives you a hint from somebody who *does* know," says attorney Allen Bloom, who uses both fundamental and technical analysis software packages.

> "It is legal gambling," day-trader David Baluh confesses. "You're trying to beat the market."

The most exotic (and pricey) technical analysis programs resemble electronic versions of ancient astrolabes, basing their graphs on astrological movements, sound-wave patterns, or the natural-numbers theories of medieval Italian philosophers. Many stockbrokers also use these tools—sometimes as secretly as the alchemists of old. However, even the more terrestrial technical programs are extremely controversial. Many financial experts regard technical analysis as voodoo. Furthermore, they point out, it's now common (especially in the commodities market) for individuals with large investments to deliberately trigger all the technical programs' alarms and profit by the result (a process called *reverse engineering*). Proponents of technical analysis argue that a company's past is just that—past—and that looking backward does nothing to predict the future of the stock. "'Long-term' is a code word for 'Get out as soon as possible,'" says syndicated financial software columnist Bob Schwaback (who uses several technical programs).

David Baluh, a former critical care nurse, has been able to trade his uniform for a cowboy hat, move to a pleasant small town, and stay home with his five young children. Baluh now makes a living as a day-trader. In *USA Today*'s competition for amateur stock trading, he ranked first for Oklahoma and 43rd nationwide. Spending from 10 minutes to 7 hours a day at his computer monitor, he averages between $200 and $500 actual profit per day by hopping on ascending rockets and leaping off before they dive. "It *is* legal gambling," he admits. "You're trying to beat the market."



Not a Get-Rich-Quick Activity

Baluh uses Sygnal (an electronic ticker tape) to download real-time quotes over a cable system, and Metastock's technical analysis program. He also pays heed to his intuitions, which arise from seven years of research. But he counsels neophytes against following his path. "Anybody can buy a PC

STEVE JENNINGS

and software," he says. "But it's not a get-rich-quick activity. You need to read books, newsletters, and magazines *before* you buy your software. My recommendation is to go slow, venture only what you can afford, take your initial investment out as soon as possible, and reinvest only the profit."

The Experts Look at the Amateurs

When brokers and financial experts look at the software that's now available, they're impressed—with the software, but not necessarily with everyone who uses it. Taking your finances into your own hands can be dangerous, they say. You can end up going broke—or going back to the broker.

But entrusting money to a broker isn't necessarily safe, either. "People working at home can have more information available to them from the software than even the biggest brokerage houses," says Frank Gaylord. Before he bought his current array of mainly technical programs, he gave up working as a broker because he had no confidence in the stocks he was choosing.

Active New York stockbroker Joel Bernstein is another software fan who cautions potential PC investors to use newly available resources wisely. "What's available today to the amateur is what used to be available only to professionals," he says. "But you have to treat it like a job—at least like a part-time job."

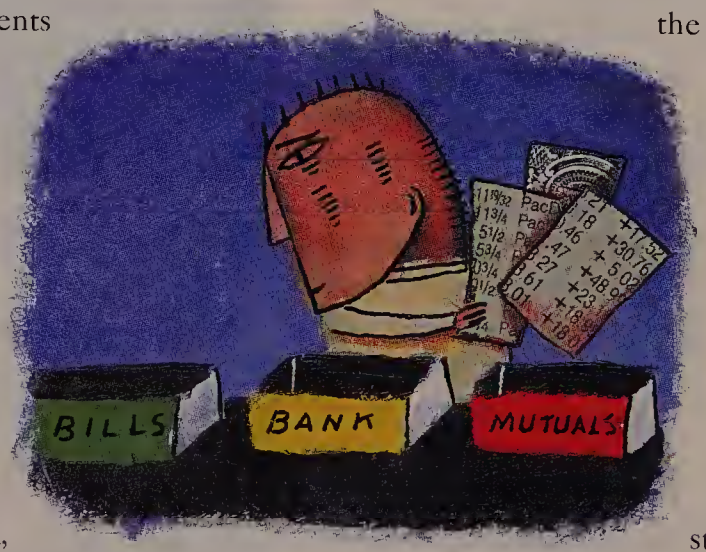
"It's like growing vegetables," says Harold Parker, a broker with Smith-Barney in Los Angeles. "If you have time for it, you'll

Picking the Right Investment Tool

By Eric Tyson

Before you can start using your computer to organize your financial information, research your investments, or trade online, you have to pick your software tools from the 500 or so programs on the market. This wealth of options might leave some newcomers scratching their heads, but look on the bright side: This market is competitive. And competition means the software is affordable—well within striking distance of the beginner. But if you don't know what you're looking for, you could end up feeling like an untanned tourist in a cutthroat bargain bazaar. To help you defend yourself, we've selected our top choices in the following financial software categories.

These tools can help with every facet of your finances: from accumulating a nest egg to tabulating gains and losses; from getting stock prices to researching investments and trading from your PC.



Getting Organized

If all you want is software to help keep tabs on your money, a money manager is for you. Besides balancing your checkbook and paying your bills, money managers help you keep track of long-term financial matters, such as employer-sponsored retirement accounts. Then, should you decide to take a more active role, you can add a number of more specifialized tools to your software arsenal.

There are several money managers on the market, but none of the newcomers has been able to upstage the two long-time leaders: Quicken, from Intuit, and Meca's Managing Your Money. Dollar for dollar, they're still the best buys for versatility and ease of use.

Quicken 3.0 for Windows/Quicken Companion 2.0

If you don't have vast sums to invest, Quicken can help meet the challenge of saving. Don't stop hoping for a long-lost relative to die and leave you a fortune, but until you strike it rich, Quicken can help with the mundane task of reining in your spending.

But Quicken is more than just a money manager. It's a great tool for tracking investments. Not only will it organize your assets, it will track the purchase price, current market values, and rates of return. If you have accounts at numerous investment firms, Quicken will reduce the clutter of tracking your financial empire.

More robust investment tools are available through Quicken Companion 2.0, an add-on to the Windows version of Quicken. Quick Companion includes access to up-to-date stock prices, either through the CompuServe online service or using a 900 number that charges you $1 per minute. (That may sound like a hefty fee, but once you set up the list of investments, you can download the stock quotes quickly. Depending on the speed of your modem and the time of day you place the call, you can retrieve as many as 15 to 20 securities prices in a 1-minute call.)

Quicken (DOS and Windows versions), $69.95; Quicken Companion (Windows only), $34.95 ($19.95 if you already have Quicken); *Intuit, 800/624-8742*

Managing Your Money 1.0 for Windows

First released in 1984, Managing Your Money is the granddaddy of home finance packages. But until this spring, users had to struggle with a DOS interface. MYM for Windows' friendly and unique interface invites you into the world of finance. The opening screen depicts a home office (drop-down menus are also available). If, for example, you want to write a check, click the checkbook. To check your investments, click the Investment board behind the desk. Quicken is still easier to use, but this is a leap in the right direction.

Managing Your Money has the upper hand in tackling issues like retirement planning, buying a house, and sorting through life insurance options. Another strength is the investment advice by noted financial guru Andrew Tobias. Among his many excellent recommendations: Put as much as possible into tax-sheltered retirement accounts, and don't use life insurance as an investment.

JAMES YANG

get better vegetables if you grow your own. But if you can't give time to your garden, you probably won't get a good crop."

Parker, an admitted perfectionist, averages 12 hours a day at his work. He's seen amateurs succeed after spending just a few minutes a day using the software, and he's also had former clients come back to him after wasting so much time that they finally gave up. "They came to the realization that their time could be better spent elsewhere," he says.

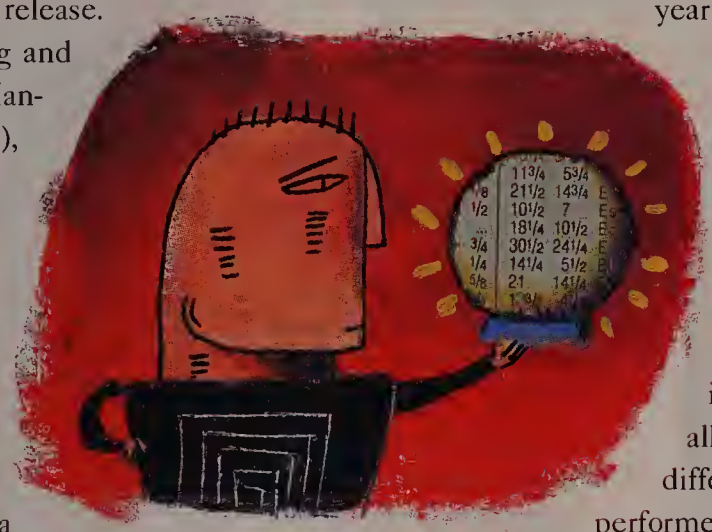
Virtually every expert we spoke with said the main problem is that amateurs can go astray if they don't take time to learn about investing *before* they put money down. And the software can't control its users' emotions. Investment is a game in which everybody loses some of the time. Some amateurs make the mistake of betting their egos along with their money, shriveling at the smallest losses. Conversely, others get so emotionally attached to their holdings that they confuse a stock with a spouse (for better, for worse, for richer, for poorer) and won't sell even when "their" company heads down the tubes.

Many people want a lot of gain at low risk, and that's not realistic. "The programs are great tools. So is the scalpel—but not for everybody," says Parker.

Bob Schwaback puts it another way: "If you're only going to put in a small amount of time, and you want a safe long-term investment, plant walnut trees. They'll always give you a good return."

Managing Your Money has almost enough investment planning features to warrant putting it into the Retirement Planning category. But many of the tools that are available in the DOS version—the capability to download stock prices, research investments, and trade online—were omitted from this Windows release. Version 2.0 will offer electronic bill paying and securities and investment quote retrieval. Managing Your Money (DOS and Windows), $79.95; *Meca Software, 800/820-7457*

Reader service no. 744



Planning to Get Rich

Some of the best retirement planning programs come from the nation's largest mutual fund providers. These programs can run what-if scenarios to help you determine a cohesive plan that fits your budget. The downside: They're DOS only, and they aren't available at your local Egghead or CompUSA.

Retirement Planning Thinkware

Fidelity Investments' retirement planning software helps you understand the importance of planning for retirement. It calculates what you should invest annually to reach your goals, guides you through developing a strategy, and teaches you about Fidelity's funds. While it's a bit self-serving to provide information on only Fidelity's own funds, it's not a huge problem, given the company's quality mutual funds. And even if you don't invest in Fidelity's funds, the rest of the package's retirement planning advice and investment information is easily worth the $15 purchase price.

In minutes, Fidelity's Thinkware can whip through calculations that would take hours with a calculator and scratch pad. You can change your assumptions on the fly and see immediately what effect the changes will have on your retirement goals. Unfortunately, though, it takes a long time to page back and forth among the screens, so chances are you won't have the patience to make full use of its what-if tools. Retirement Planning Thinkware (DOS only), $15; *Fidelity Investments, 800/457-1768*

Reader service no. 745

Retirement Planner

This package from The Vanguard Group is a whiz at running different retirement planning scenarios, so you can select investments based on personalized factors, such as your desired rate of return or your initial bankroll. You can also perform what-if analyses to see how you'd fare with different priorities. For example, the software calculates the impact of earning a couple more percentage points a year on your investment balances by investing in a fund with a higher yield. You may decide you don't want the added risk, but at least you'll be aware of the trade-offs.

While Vanguard's package does not have the colorful graphics you'll find in Fidelity's, it's better at explaining the risks of investing in the stock and bond markets. It allows you to see how portfolios with different mixtures of stocks and bonds performed all the way back to 1926. While history won't necessarily repeat itself, this invaluable feature allows you to invest with realistic expectations, so you won't panic and sell the first time securities prices drop.

Vanguard's Retirement Planner has one significant drawback: It's cumbersome for a couple to run a single plan, particularly if they aren't the same age. Retirement Planner (DOS only), $15; *The Vanguard Group, 800/876-1840*

Reader service no. 746

Doing Your Homework—and Reaping the Rewards

Investment research software packages usually separate investment beginners from those who love to wallow in data. But unless you're a seasoned investor, you may have difficulty differentiating the good information from mediocre and downright awful advice.

The software listed here offers solid advice, but be careful. Many packages connect you to an online service for information or to trade. Unless cost is no object, keep tabs on your connect time so you don't spend too much money just accessing the information.

And before you plunge into the data jungle trying to become the next Peter Lynch or Warren Buffet, don't fool yourself into believing that you'll beat the markets. Even professional investors rarely manage to. Witness the fact that over long periods of time (more than ten years), mutual funds that invest in a fixed market index

The TI TravelMate™ family of notebooks offers the perfect workmate to increase your productivity. Because different kinds of people have very different demands, we have created two series – the 4000E and the 4000M – to meet your individual needs.

Every member of the TravelMate family features a powerful 486 processor – up to 75MHz. Combined with monochrome or brilliant color displays, superb battery life, and a variety of configurations, you can be more productive even when you're on the go.

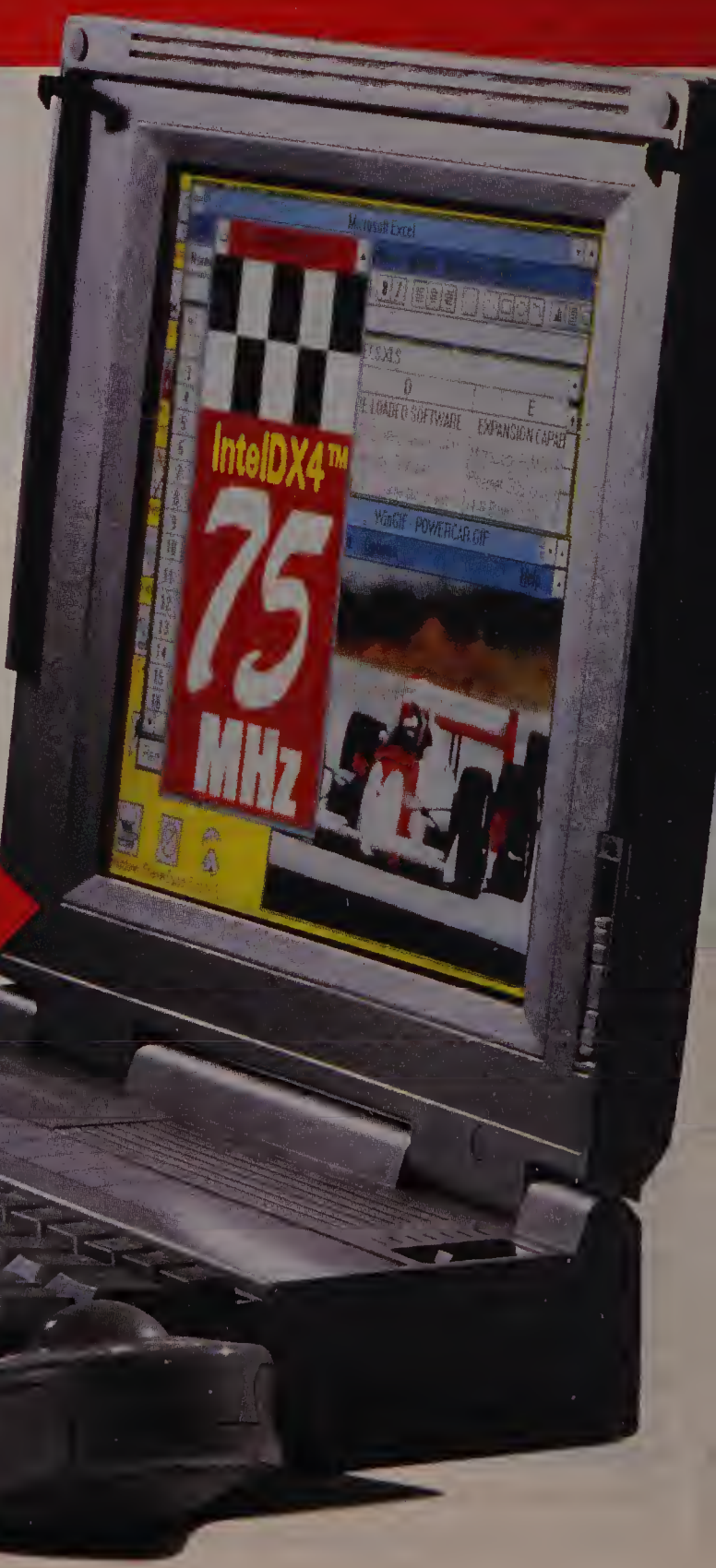
The perfect desktop replacement. The TravelMate E Series.

Looking for the expansion capabilities of a desktop coupled with the portability and convenience of a notebook? Turn to the TravelMate 4000E Series. Partner the TravelMate 4000E with TI's Intelligent Docking System and you have the ultimate desktop PC replacement. Just insert any of the nine models of TravelMate 4000E notebooks into the Intelligent Docking System, push a button and the auto-load mechanism does the rest. When you're ready to hit the road, simply click an icon and the system saves the files you're working on,

The TravelMate Notebooks Now there's a perfect

TravelMate E Series

- Nine 486 models ranging from a 25MHz to a racy IntelDX4™/75MHz
- 4mm full-travel keyboard with a desktop feel, Microsoft BallPoint™ mouse with QuickPort™ connection
- Desktop Replacement: Intelligent Docking System with 6 ISA and 2 PCMCIA card slots as well as 4 drive bays for additions such as hard drives, CD-ROM, tape drives and more



intel inside

PC WORLD BEST BUY

PC MAGAZINE SERVICE & RELIABILITY READERS' CHOICE

75MHz now under $4,000*

*Estimated street price, E Series Model. Dealer prices may vary. IntelDX4 is a trademark and the Intel Inside logo is a registered trademark of Intel Corp

closes Windows™ and ejects your TravelMate 4000E. Then you're on your way – that's true desktop replacement.

A new dimension in portable computing. The TravelMate M Series.

If you're looking for a notebook computer that is multimedia-ready, TI brings you the new TravelMate 4000M Series. From the moment you see our TravelMate 4000M, you'll appreciate how much performance it packs into its sleek new design and conveniently located integrated pointing device.

Add the light-weight, battery/AC-powered Portable CD-ROM Docking System and you have an integrated portable multimedia system. Now you can tap into the growing library of information and applications available on CD-ROM. Use the TravelMate 4000M as an incredibly powerful presentation tool, training or auditing system and more – complete with sound and full-motion video capability.

To find out how you can get together with the ideal TravelMate, just call **1-800-TI-TEXAS** (1-800-848-3927).

from Texas Instruments.
mate for everyone.

TravelMate M Series

- Six 486 models ranging from a 25MHz to a racy IntelDX4™/75MHz
- Built-in PCMCIA slot, integrated pointing device, SCSI II interface, 16-bit sound, internal microphone and speaker, and a 16-bit MIDI port
- Portable CD-ROM Docking System option with a double-speed CD-ROM drive and built-in stereo speakers

EXTENDING YOUR REACH™

TEXAS INSTRUMENTS

TravelMate and "Extending Your Reach" are trademarks of Texas Instruments. Windows, BallPoint and QuickPort are trademarks of Microsoft Corporation.© 1994 TI.

Circle 244 on reader service card

tend to outperform many of their actively managed peers, thanks to lower operating expenses.

Reuters Money Network for Quicken Users

This program works in Quicken's portfolio manager to download investment prices and give you access to the Reuters Money Network online service. For a fixed monthly fee (starting at $9.95), you get mutual fund information from Morningstar; reports on stocks and bonds from Standard & Poor's; and financial information and news from Dow Jones, Reuters, *Money* magazine, and other sources. An additional $6.95 per month gets you Reuters' Personalized News Clipping Service, which culls articles on your specific portfolio from publications on the Dow Jones News Wire—a great time-saver.

You can also trade directly from Reuters, though you won't get direct access to your investment accounts. But if you trade frequently or have investments in lots of accounts, you'll like the fixed rate.

Reuters Money Network focuses on current news sources that are of greatest interest to investors trying to outfox the markets. The drawback is that the package doesn't have historical information. Reuters Money Network for Quicken Users (Windows only), $24.95. Also available: Reuters Money Network for DOS ($49.95) and Reuters Money Network for Windows ($24.95). They run solo and have portfolio managers. *Reality Technologies, 800/346-2024*

Reader service no. 747

The Telescan System

If you want to do comprehensive screening of individual stocks, The Telescan System online service is what you've been looking for. It lets you perform stock searches using dozens of variables, including historic and projected earnings, valuation, assets, and liabilities. It also allows you to easily obtain pricing charts for individual securities and mutual funds for the past 20 years.

The cost of Telescan depends on how you use it and what billing method you select. If you use it occasionally, the Per Minute Plan is your best bet. You're charged $0.41 to $0.94 per minute (higher rates apply during prime time, 7:00 a.m. to 6:00 p.m., local time), plus $0.10 per graph and $2.00 per search. You can buy unlimited access through the Flat Rate Plans, which range from $45 per month for unlimited non–prime-time usage to $500 per month for unlimited access at any time. Besides the usage fees, Telescan charges $13 shipping and handling for the software and a $50 annual fee for use of the service. *Telescan Inc., 800/324-4692*

Reader service no. 748

Morningstar Mutual Funds OnFloppy & OnDisc

Mutual fund data hounds will delight in Morningstar Mutual Funds OnFloppy, a software package that provides statistical information on 4000 mutual funds—more than triple the number found in Morningstar's printed directory.

If you already suffer from information overload, save your dollars. If you like lots of data, this package can save time and filing space. Avoid the mistake of selecting funds based on Morningstar's Star Rating system. These are simply a history of a fund's performance, and history rarely repeats itself. Morningstar also offers Morningstar Mutual Funds OnDisc, a CD ROM that gives more in-depth information and analysis. Both are DOS only. OnFloppy, $45, plus $95 per year for quarterly or $185 for monthly updates; OnDisc, $295, plus $495 for quarterly or $795 for monthly updates; *Morningstar, 800/876-5005*

Reader service no. 749

Value Line Value/Screen III

The Value Line Value/Screen III is a disk-based program that offers data and rankings from Value Line Investment survey, the newsletter the *Hulbert Financial Digest* says has the best record for picking stocks. Problem is, it's not very easy to use.

Besides researching individual stocks, the package tracks your stock portfolio and downloads pricing updates via the Dow Jones News/Retrieval service. A two-month introductory offer (DOS only) costs $59, and annual subscription prices cost $325 for quarterly updates and $465 for monthly updates by mail. Electronic monthly updates cost $495 per year. *Value Line Software, 800/654-0508*

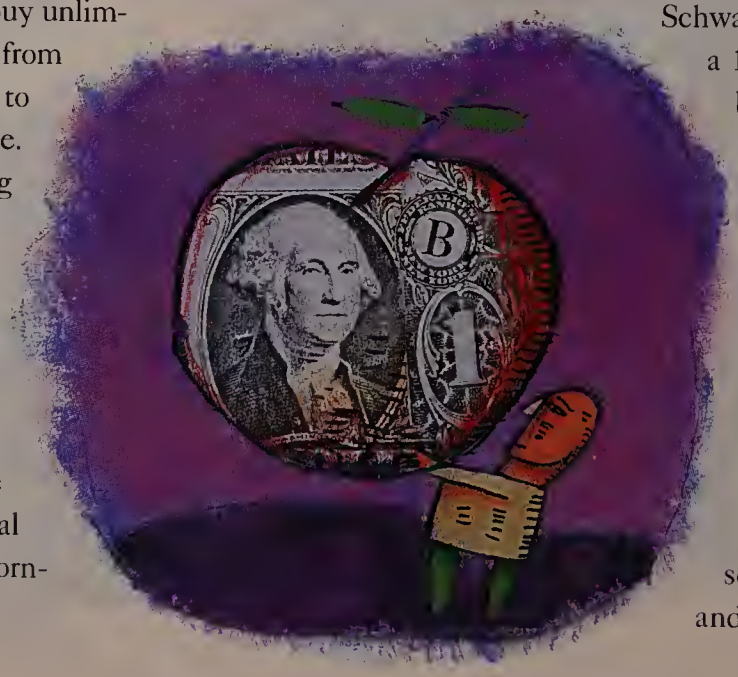
Reader service no. 750

The Fruits of Your Labor

Some services allow you to track the performance of your accounts and buy and sell directly from your PC. You save the hefty broker fees, and you can trade any time of day or night.

Charles Schwab's StreetSmart

Charles Schwab, the fast-growing discount securities and mutual fund company, last year offered the first Windows online trading service. It provides investment research, helps track your account's performance, and lets you trade through Schwab. StreetSmart provides free real-time quotes and investment information held through your brokerage account. You'll see only Schwab investments in StreetSmart, but you can enter others manually, and Schwab rewards PC trading with a 10 percent discount off its broker-assisted fees.



JAMES YANG

StreetSmart charges on a fee-for-service basis for DJN/R and Standard & Poor's MarketScope. With StreetSmart, you can bill these services to your Schwab account or credit card. DJN/R charges $1.50 per 1000 characters; company research reports cost $4.50; and Standard & Poor's Mar-

One World.
One Communications Software.

PROCOMM PLUS for Windows 2.0.

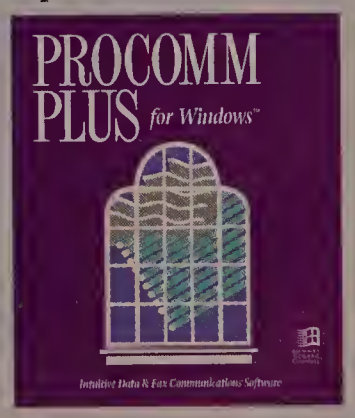
Integrating fax with data opens up a whole new world in communications software.

PROCOMM PLUS for Windows 2.0 is here with new features which are above and beyond all other communications software programs. First up, you have access to complete fax capabilities including a fax viewer, scheduling, broadcast send, and the ability to receive faxes in the background; all from right within PROCOMM PLUS for Windows.

Plus, with the fully-customizable Action Bar,™ you can easily activate frequently used features with immediately understandable icons. You'll find our new Dialing Directory smart enough to serve as a single phone source to organize voice, fax and data calls. Enhanced ASPECT scripts automate on-line sessions with services like CompuServe and MCI Mail. Our GIF viewer displays graphics as you download them. And in the intuitive PROCOMM PLUS tradition, everything is extremely powerful and easy to use.

Call us at 1.800.315.3282 to upgrade for just $69.

To start fresh, visit your computer retailer. PROCOMM PLUS for Windows 2.0...a whole world is waiting.



PROCOMM PLUS. for Windows™

TOTALLY CONNECTED

DATASTORM • P.O. Box 1471 • Columbia, MO 65205 • 314.443.3282

All brand and product names are trademarks or registered trademarks of their respective holders. Copyright © 1994 DATASTORM TECHNOLOGIES, INC. All rights reserved.

Circle 94 on reader service card

ketScope costs $0.80 to $1.20 per minute, depending on time of day. StreetSmart, $59; *Charles Schwab and Company, 800/334-4455*
Reader service no. 751

Fidelity's On-line Xpress

Fidelity's On-line Xpress (FOX) offers many of the same features as Schwab's StreetSmart but handles only Fidelity mutual funds, and its DOS interface is less appealing. You also need separate billing accounts with each provider (for example, DJN/R, Standard & Poor's); with StreetSmart, you pay through Schwab. Choose FOX only if you don't like Windows or prefer Fidelity's funds. Fidelity's On-line Xpress (DOS only), $49.95; *Fidelity, 800/544-0246*
Reader service no. 752

Naomi Wise is a San Francisco–based freelance writer. Eric Tyson is a San Francisco–based personal finance writer and author of Personal Finance for Dummies *(IDG Books, San Mateo, California, 1994). Judy Heim is a contributing editor for* PC World.

Going Online for Investment Advice and Information

Want to use your computer to manage your investments, but don't want to spring for new software or services? If you have a membership in a general-interest online service, there's plenty of information at the end of your modem. All the major online services provide relatively cheap end-of-day market quotes and market news. You'll also find lively public investment conferences—wonderful places to exchange ideas with other investors or even boost your financial I.Q.

Following is the best of what's available. There isn't much on the Internet for investors, so you won't find it listed.

America Online

America Online has fewer financial databases than other services, but low access fees and a few key attractions make it a favorite of small investors. It has the popular Morningstar, which details the performance of mutual funds and ranks them. And AOL's portfolio feature is also quite popular. Enter data about your stocks, then call America Online for 15-minute–delayed market quotes. AOL will track your gains and losses for you.

AOL's big drawback is that it's woefully slow. For quickest access, call during the day. A month's subscription is $9.95 (credit card) or $11.95 (checking account transfers). You get 5 hours of free access per month. After that, it's $3.50 per hour. *America Online, 800/827-6364* **Reader service no. 801**

CompuServe

Among online services, CompuServe has the largest library of financial information. Its best resources are the free market quotes and the investors' conferences—more spirited than conferences on other services. You'll also find daily and historical stock, bond, and commodity prices. You can find a company's balance sheet, SEC filings, and corporate holdings and affiliations, and also analyze an investment by stock price and other basic data.

Penny-conscious investors can access daily stock quotes and *Money* magazine's mutual fund database as part of the basic $8.95-per-month membership. And for just $1 CompuServe will graph the performance of a stock. You can also read a company's Standard & Poor's profile for $1; for $2 you can read the latest S&P stock picks. You can screen stocks by such variables as book or market value, growth rate, and more, but it's pricey ($5 per screen, plus $0.25 per issue).

Access to some of the databases runs as high as $40 an hour, so be vigilant about cost. Membership costs $8.95 per month plus access fees ($4.80 per hour at 2400 bps, $9.60 for 9600 and above). *CompuServe, 800/848-8199* **Reader service no. 802**

Dow Jones News/Retrieval

Dow Jones News/Retrieval is the premier online source of financial information, but high access fees have put it out of reach of most small investors. Fortunately, Dow Jones offers a low-cost service called Market Monitor. It gives you 8 hours of evening access to closing market quotes, daily historical quotes, a mutual fund searcher, Standard & Poor's profiles and more—all for a flat fee of $29.95 per month.

However, you'll pay more for Dow Jones' premium databases, such as Dun & Bradstreet or Tradeline reports and financial records. The charges range from $1.50 for approximately each screen of information, to as much as $106 per report. *Dow Jones News/Retrieval, 800/815-5100* **Reader service no. 803**

Prodigy

Prodigy offers some of the most innovative services available online for small investors. For $1.95 (each time) you can read a newsletter with a compelling selection of stock tips. And Prodigy's Stock Hunter lets you troll for stock picks using any of eight stock models. Cost is $5.95 each time you access the Stock Hunter.

Prodigy's Strategic Investor feature has daily market news assembled by *Investor's Business Daily*, accesses fundamental data ranging from balance sheets to key ratios on over 5000 companies, and displays charts on a stock's performance.

There are also regular online columns by financial gurus like tax pro Julian Block, plus the text of *Barron's* and the *Wall Street Journal*'s "Talk of the Street" column. Frequent celebrity visitors to the Moneytalk BBS also liven up the service. Unfortunately, Prodigy is slow, slow, slow.

Subscriptions range from $7.95 to $29.95 per month. The startup software costs $4.95. *Prodigy, 800/776-3449* **Reader service no. 804** **—Judy Heim**

JAMES YANG

DEEP DOWN IN WINDOWS,™ SOMETHING IS TRYING TO DRAIN THE LIFEBLOOD FROM YOUR SYSTEM.

Quietly, stealthily, something is slowly sucking up the storage space and speed of every Windows user. It's the living remains of every program you ever thought you had replaced. UnInstaller exorcises these undead data, bringing disk space and operating speed back to life in seconds. For a suggested price of only $69.95, UnInstaller gives you a simple choice: the quick or the dead. Only UnInstaller cleans Windows.

UNINSTALLER™ VERSION 2.0

1994 WIN AWARD W 100 WINDOWS MAGAZINE

UnInstaller is available at resellers everywhere.
Or call 800-922-3383 to order your copy today.

UnInstaller is a trademark of MicroHelp, Inc. Windows is a trademark of Microsoft Corp.

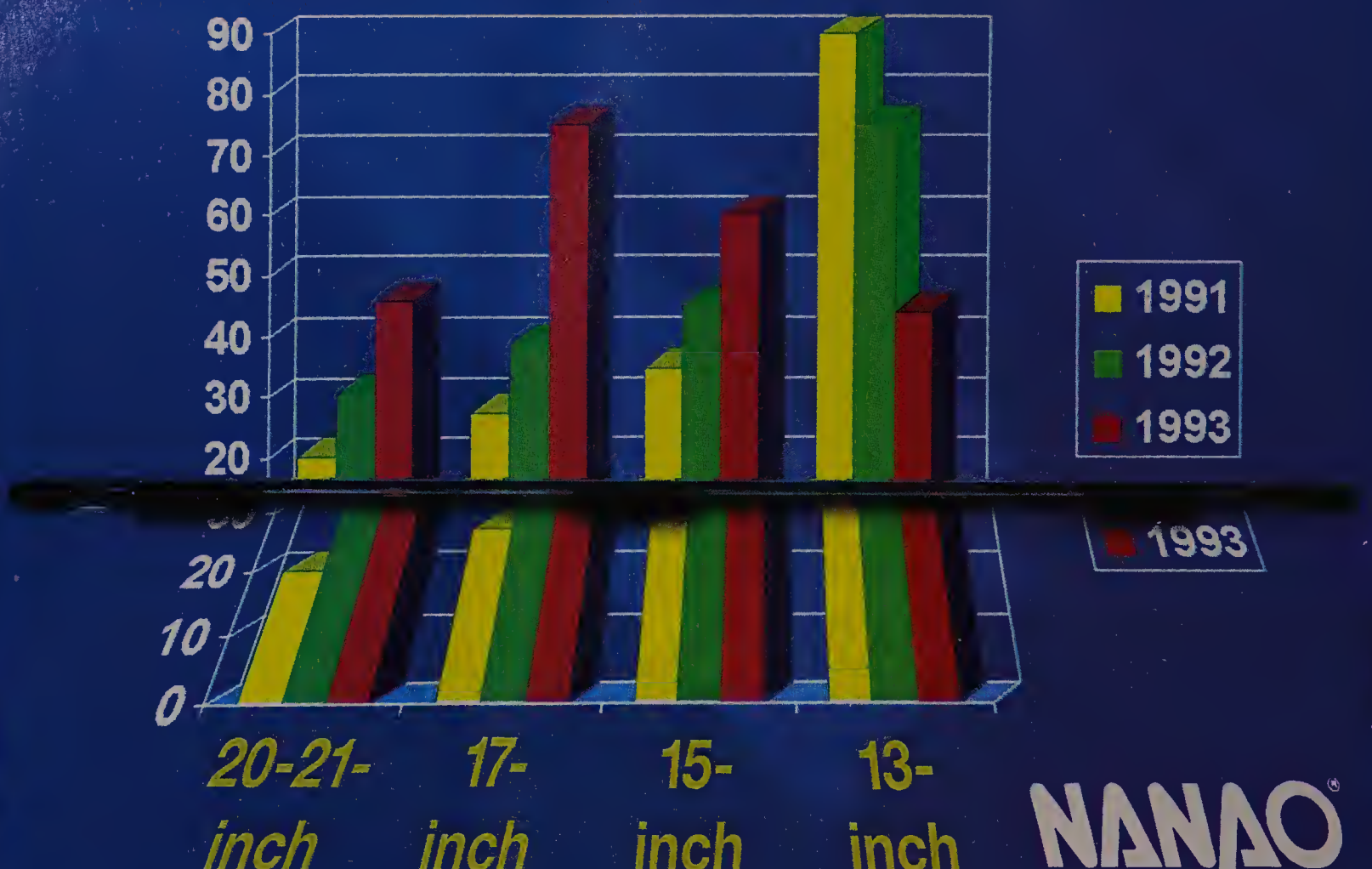
Circle 161 on reader service card

MICROSOFT WINDOWS COMPATIBLE

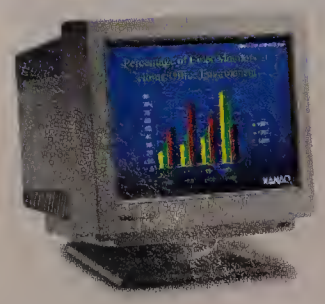
NANAO USA Corp.

Now what you see is what you print.

r Monitors in vironment



NANAO®



Nanao has something you've been waiting for: WYSIWYP. We're the first monitor manufacturer to include new Colorific™ color management software free with our 17" or larger FlexScan® professional display monitors. With easy-to-use, set-and-forget Colorific, you can print graphs, presentations, transparencies and other business documents – the first time – in the colors you actually see on the screen. Just think what this means: output color accuracy. Time savings. Reductions in trial-and-error draft printing. No more surprises. Colorific is the first software-only color calibration system that replaces add-on hardware solutions costing from $300 to $1,000. And it's available today. Once again, Nanao continues a tradition of industry innovations. Our award-winning FlexScan family of monitors are renowned for ultra high resolution, sharp edge-to-edge focus, energy-saving features and high product reliability. Now we're adding one more breakthrough to the list: WYSIWYP with Colorific.**

INCLUDING SONNETECH'S colorific WITH KODAK COLOR MANAGEMENT SYSTEM

NANAO®

Superior In Every Detail

NANAO USA CORPORATION
23535 Telo Avenue, Torrance, CA 90505
(310) 325-5202 Fax: (310) 530-1679
1-800-800-5202

*3 Year Warranty**

*Superior In Every Detail is a registered trademark of Nanao Corporation. All product names are trademarks of their respective companies. ©1994 Nanao USA Corporation. *3 year on P & L. 1 year on CRT. **Actual printout may vary. Colorific provides nearest possible match of output.*

Circle 194 on reader service card

WINDOWS DETECTIVE

Solving the Mysteries of ERROR MESSAGES

How to track down the most common causes of crashes, and what to do about them now—and later.

By Michael S. Lasky

General Protection Error. They appear without notice, invariably when you're on a tight deadline.

Call to Undefined Dynalink. They are all but indecipherable, and they give you no idea what to do next.

Application Execution Error. They are the mysterious error messages that pop up in Windows. Virtually anyone who's used Windows has been stopped cold by these ominous declarations of doom. And as hard as they are to understand, it's even harder to know what to do when they appear. Should you click OK, Ignore, or Cancel? Which of these limited choices will let you save your work before you restart Windows or reboot your machine? And how about the future? What can you do now to prevent these error messages from recurring?

Until now, good advice on error messages has been hard to find. Manuals are all too often silent on the subject. Product support at Microsoft or the company that made the application may or may not have the answer, and they're usually a toll-call away.

GORDON STUDER

Well, you can save your quarter. We contacted Microsoft's Product Support team for you and, with their guidance, came up with the following troubleshooting guide to the most common Windows error messages. We've condensed these explanations for the sake of space. If you want more details on these and other error message solutions, look for ERRORMSG.ZIP on PC World Online (see page 10 for details).

> **General Protection Fault. *Filename* caused a General Protection Fault in .Module *filename* at *memory address*.**

WHAT IT MEANS: The most common error message of all, the 'General Protection Fault' (GPF) is the most vexing to fix because it can have so many causes. The commonest of these is when Windows or an application tries to access memory improperly. Sometimes an application tries to read or write to a memory location to which it hasn't been granted access, while other times it attempts to overwrite its own memory segments. In either event, the code already residing in that part of memory is erased or corrupted, and you're left staring at an error message.

WHAT TO DO NOW: *Note the cause.* Before you do anything else, note the module in which the GPF occurs. This information can offer a crucial clue that will help you in future troubleshooting. For example, GPFs in KRNL.386 usually indicate memory problems. Errors in GDI.EXE often indicate problems with either video or printer drivers. GPFs in USER.EXE can mean that you have problems with sound drivers or with input and output devices, such as the keyboard or the mouse. If an error keeps popping up in a particular module, chances are the error is software-based; random errors more often relate to memory conflicts and hardware problems.

See "Can This File Be Saved?" for tips on how to save your data. You'll probably have to reboot, but at least you may be able to recover your data.

WHAT TO DO IN THE FUTURE: *Save your work often.* If your application has an autosave option, use it. Otherwise, make sure to save your files frequently as you work. Back up your hard drive regularly.

Keep system resources free. An application running in the background with scant system resources can cause memory conflicts. From Program Manager, select *Help•About Program Manager* and see what percentage of your system resources is free. If you're working in an application that has caused GPFs in the past, try to keep at least 60 percent of your resources free.

Check the DOS version you are using. Original equipment manufacturer (OEM) versions of DOS that come with certain brands of PCs (such as Compaq MS-DOS) should be used only on their respective PCs.

Run Windows without WIN.INI. The GPF could stem from corrupted fonts, printer drivers, or software loaded when you started Windows. For that reason, try to open Windows without WIN.INI: Exit Windows and, at the DOS prompt, enter **REN C:\WINDOWS\WIN.INI WININI.OLD**. Restart Windows and try to re-create the GPF by opening the applications and documents you were using at the time of the error message. If you can't re-create it, change WININI.OLD back to WIN.INI, then open it in a text editor. Place a semicolon in front of the Run= and Load= lines, save the file, and restart Windows. Again, try to re-create the errors. If you can't, one of the programs in the Run= and Load= lines is causing the

Can This File Be Saved?

By the time an error message arrives on your screen, chances are it's too late to save your work. But here are a few things to try whenever any error message freezes your system.

Open Task Manager. **When the error message appears, press <Ctrl>-<Esc>. If nothing happens, try double-clicking on your desktop. One of these maneuvers may succeed in calling up the Windows Task Manager. If the Task Manager window appears, highlight the name of the crashed app, and select the *End Task* button. If this works, you'll have closed the crashed program. Your file will be saved correctly, or at the very least, a recoverable temporary file will be created (see the following discussion).**

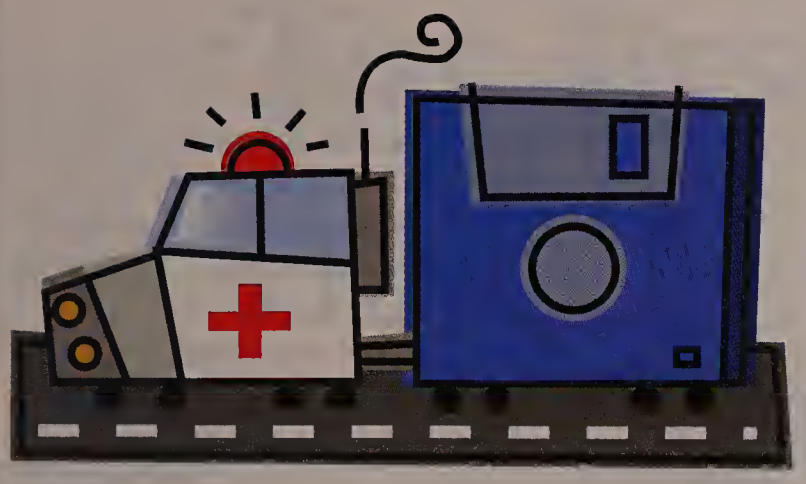
If you can't close the crashed app in this way, select one of the open apps in the Task Manager list and click *OK*. Once you're in the app, save your open files, then close the application. Repeat this procedure for your other open apps, then proceed to the following steps.

Hit <Ctrl>-<Alt>-<Delete>. **The three-fingered salute should bring up one of two system messages. The first, 'System has either become busy or has become unstable', usually indicates a less-than-fatal error. If you get this message, press any key to return to Windows, and then wait a couple of minutes. If the system doesn't recover, you'll have to restart your system by pressing <Ctrl>-<Alt>-<Delete> twice.**

The other message you might see is 'This Windows application has stopped responding to the system'. If you get this message, try pressing <Esc>. If this returns you to your application, save your work, then exit and restart Windows. If <Esc> doesn't work, try <Enter>. Any work you've done in the crashed application will be lost, but you'll have a chance to save your work in other applications. Finally, if neither <Esc> nor <Enter> succeeds, you'll have no alternative but to press <Ctrl>-<Alt>-<Delete> and then reboot your computer.

Look for TMP files. **Back in Windows, start File Manager and search for all files with the extension .TMP and any files whose names begin with a tilde (~). The reason: Your work may have been saved in a temporary file before you crashed. Don't restrict your search to your \TEMP directory, either; temp files can be stashed anywhere on your hard disk.**

Once you've found all the temp files you can, sort them by date. Look for the most recently created files; the latest one is most likely the file you were working on when the error occurred. After noting the file name, reopen it in the application you were using when the error occurred. If you're lucky, you'll find most of your changes have been saved.



error; use the process of elimination to find out which one. If this doesn't work, try reinstalling your printer drivers and fonts.

Reinstall the software. If the error message occurs in a specific application, the app's files on your hard disk may be corrupted or damaged. Try reinstalling the software.

Eliminate possible software conflicts. Make sure the StartUp group is empty, turn off all screen savers, and don't run Windows from a menu program like MS-DOS Shell.

Eliminate possible hardware conflicts. Configure Windows with a plain-vanilla hardware setup. Start Setup (in Program Manager select *File•Run*, then type **Setup**). Select *Options•Change System Settings*, and then specify a plain VGA display, no mouse or other pointing device, and no networks.

If the problem persists: The error could stem from unsupported third-party drivers, a poorly designed or corrupted video driver, incompatible terminate-and-stay-resident (TSR) programs loaded in DOS, or unsupported device drivers in your CONFIG.SYS or AUTOEXEC.BAT file. Accordingly, use the same process of elimination you used on WIN.INI to establish which driver or TSR is causing the error: Deactivate suspected lines in your start-up files by placing double colons in front of each one, then reboot your computer and try to re-create the error. If you can't, remove the double colons one line at a time, rebooting between each deletion. If and when you can re-create the error, the last line you reactivated should be the culprit.

! Divide By Zero

WHAT IT MEANS: An application has tried to divide a number by zero, resulting in computer chaos. The likeliest culprits are conflicting software programs, corrupted files, or software bugs.

WHAT TO DO NOW: *Reboot.* This error will definitely cause your system to hang.

Look for your work. After you return to Windows, check for temp files to see if your work was saved (see "Can This File Be Saved?").

WHAT TO DO IN THE FUTURE: *Re-create the error and eliminate the suspects.* Start Windows "clean" by taking all the apps out of your StartUp group, placing a semicolon in front of the Load= and Run= lines in WIN.INI, then restarting Windows. If you can't re-create the 'Divide By Zero' message in this clean setup, restore the applications you removed from StartUp one at a time until you can. If you still can't duplicate the error, create a new Run= line in WIN.INI and, using your original Run= line as a reference, add one app to it at a time. Reboot between each addition to try to get the 'Divide By Zero' error. Finally, repeat the procedure for the Load= line. Whichever component you added last is the guilty party.

Reinstall your app. If the error recurs after you've started Windows clean, try reinstalling the application that was running when you got the error message, then try to re-create the error.

Call for help. If reinstalling an application doesn't fix the problem, call the vendor for a fix or update.

! Call to Undefined Dynalink or Can't find Dynalink *filename*.

WHAT IT MEANS: You have an outdated or corrupted Dynamic Link Library (DLL). This error doesn't crash your app, but you might find it difficult to continue working. Because the error is based on a DLL the app requires, the error that stopped you in your tracks will recur until the faulty DLL is replaced.

WHAT TO DO NOW: *Restart Windows.* Sometimes just restarting Windows and then the app will fix the problem. If this works, the problem was a memory assignment glitch. If it doesn't, the DLL is most likely out of date, corrupted, or missing from the appropriate directory.

Look for your work. After you return to Windows, look for temp files to see if your work was saved before you crashed (see "Can This File Be Saved?").

WHAT TO DO IN THE FUTURE: *Replace the DLL.* If the error message referred to a specific DLL, you're in luck; replacing the file in question will probably solve your problem. You'll find most DLLs in the WINDOWS\SYSTEM subdirectory, but they also reside in application and \WINDOWS directories. Once you've found the file, compare its date to those of the other files that came with the program (in File Manager, select *View•Sort By Date*). If the DLL is older than the rest, you'll need to get a more updated version from the software publisher. If the DLL file isn't out of date, try reinstalling it from the original disks.

! Cannot find a device file that may be needed to run Windows in 386 enhanced mode. You need to run the Setup program again. *Filename.386*. Press a key to continue.

WHAT IT MEANS: A virtual device driver listed in your SYSTEM.INI file was not found at start-up.

WHAT TO DO NOW: *Restart Windows, then look for your work.* After returning to Windows, scan your hard drive for new temp files (see "Can This File Be Saved?").

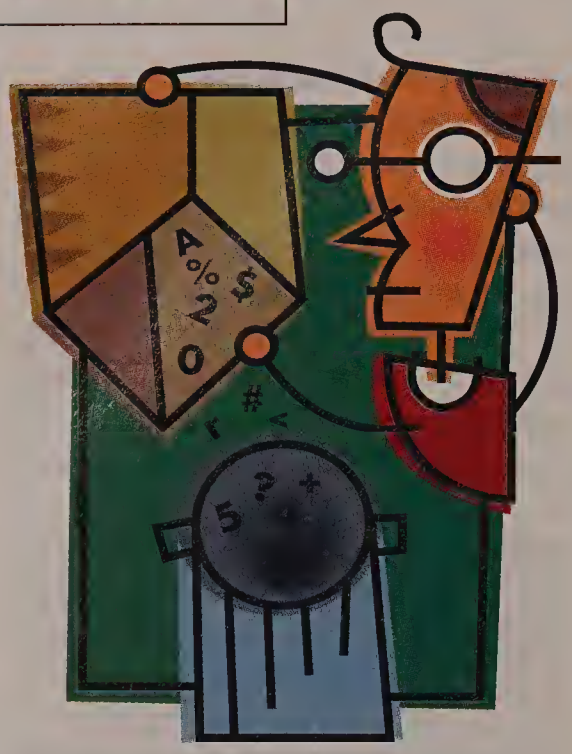
WHAT TO DO IN THE FUTURE: *Make sure you have the file.* Search for the file noted in the error message to see if it's on your hard disk: In File Manager, select *File•Search*, enter the file name in the Search For box, specify **C:** in the Start From box, and be sure the *Search All Subdirectories* box is selected. If you can't find the file, you'll have to reinstall the software.

Make sure Windows knows where the file is. Search your INI files for mentions of the missing file. Make sure the proper path name is used. If a DOS app needs the file, make sure the app's directory is in your AUTOEXEC.BAT file's PATH statement.

! Insufficient memory to run this application. Quit one or more Windows applications and then try again.

WHAT IT MEANS: Logically enough, this message pops up when a Windows app calls for memory Windows doesn't have.

WHAT TO DO NOW: *Close down other simultaneously running applications.* Press **<Alt>**-



<Tab> to switch to your other open apps, and shut them down. Then try to relaunch the original application. If the error message doesn't reappear, you've recovered enough memory.

Check the Clipboard. Sometimes the Clipboard is left holding gobs of data, which, in turn, can consume gobs of memory. You can get rid of the extraneous Clipboard contents using the Clipboard Viewer: Select *File•Run* in Program Manager, type **CLIPBRD** in the Command Line box, then delete the contents by pressing **<Delete>**.

WHAT TO DO IN THE FUTURE: *Adjust the swap file size.* Make sure your *swap file*, a dedicated portion of your hard disk used to simulate additional RAM, is big enough. In Control Panel, double-click *386 Enhanced* and select *Virtual Memory•Change.* After making sure Type is set to *Permanent*, compare the Size under Current Settings with the Recommended Size under New Settings. If the Current setting is less than the Recommended, click *OK* to accept Windows' recommendation.

Reclaim resources. To cut the drain on your system resources, reduce the size of toolbars in your applications, get rid of your wallpaper, keep icon-heavy groups closed, and load only the fonts you really need.

! KB required value too large. Decrease PIF KB Required.

WHAT IT MEANS: The application's Program Information File (PIF) says the app requires more conventional memory than you have available.

WHAT TO DO NOW: *Relax.* You're in luck; this error won't crash Windows.

WHAT TO DO IN THE FUTURE: *Make room.* You need to increase the space available in conventional memory. Make sure you're loading all the device drivers and commands you can into high memory by using DOS 6.0's MemMaker or a third-party memory manager.

Edit your PIF. Using the PIF Editor (PIFEDIT.EXE), check to be sure that the KB required value is not larger than 640K. Check your application's manual to see how much memory the app requires and set the PIF accordingly.

! Application Execution Error. Cannot find *file name* (or one of its components). Check to ensure the path and file name are correct and that all required libraries are available.

WHAT IT MEANS: When you start a Windows application, you're loading more than just an EXE file. You're loading a bunch of associated files, too. This message indicates that one or more of those files is missing from the expected directory. One common cause: moving an application's files from one directory to another.

WHAT TO DO NOW: *Read the next paragraph.* Again, you don't have to do anything; this error doesn't crash Windows.

WHAT TO DO IN THE FUTURE: *Restore the files.* If you have a backup of the application (and you should), restore it to the appropriate directory.

Relocate your files. Return any recently-moved files to the proper directory.

Reinstall the app. Your application may have a selective installation routine. If so, use it to reinstall just the files you know you need. If not, reinstall the whole thing.

! Segment Load Failure

WHAT IT MEANS: Windows can't find the application components it needs because of bad sectors or high file fragmentation on your hard disk. The result: Windows can't boot the code and instead gives you the boot. You can also get this message when you don't have enough DOS file handles specified in CONFIG.SYS.

WHAT TO DO NOW: *Grin and bear it.* You'll be unceremoniously dumped back on your Windows desktop, so there's not much you can do. At least you didn't lose any work.

WHAT TO DO IN THE FUTURE: *Check your hard disk.* If you're using MS-DOS 6.2, exit Windows and use ScanDisk to check your hard disk for bad sectors, file inconsistencies, and allocation faults. If you're using an earlier version of DOS, exit Windows and use CHKDSK, preferably with the /F switch (so the problems it finds get fixed).

Defragment your hard disk. Use DOS's Defrag or any third-party utility to defragment your hard disk (be sure to back up your data first).

Add file handles. Using the Windows system file editing utility (in Program Manager, select *File•Run* and type **SYSEDIT**, open CONFIG.SYS. Increase the number of file handles in increments of 10 by editing the line FILES=; for example, if your CONFIG.SYS currently contains the line FILES=40, change it to 50. Save the changed CONFIG.SYS, exit Windows, and reboot the computer.

Windows 4.0: The End of Rebooting?

With the imminent release of Windows 4.0 (code-named Chicago), the folks at Microsoft are hoping to make the Windows reboot a thing of the past. Mind you, Microsoft isn't saying you'll never see another error message. But with the new version of Windows, the company claims you'll no longer have to press <Ctrl>-<Alt>-<Delete> every time an application goes south on you.

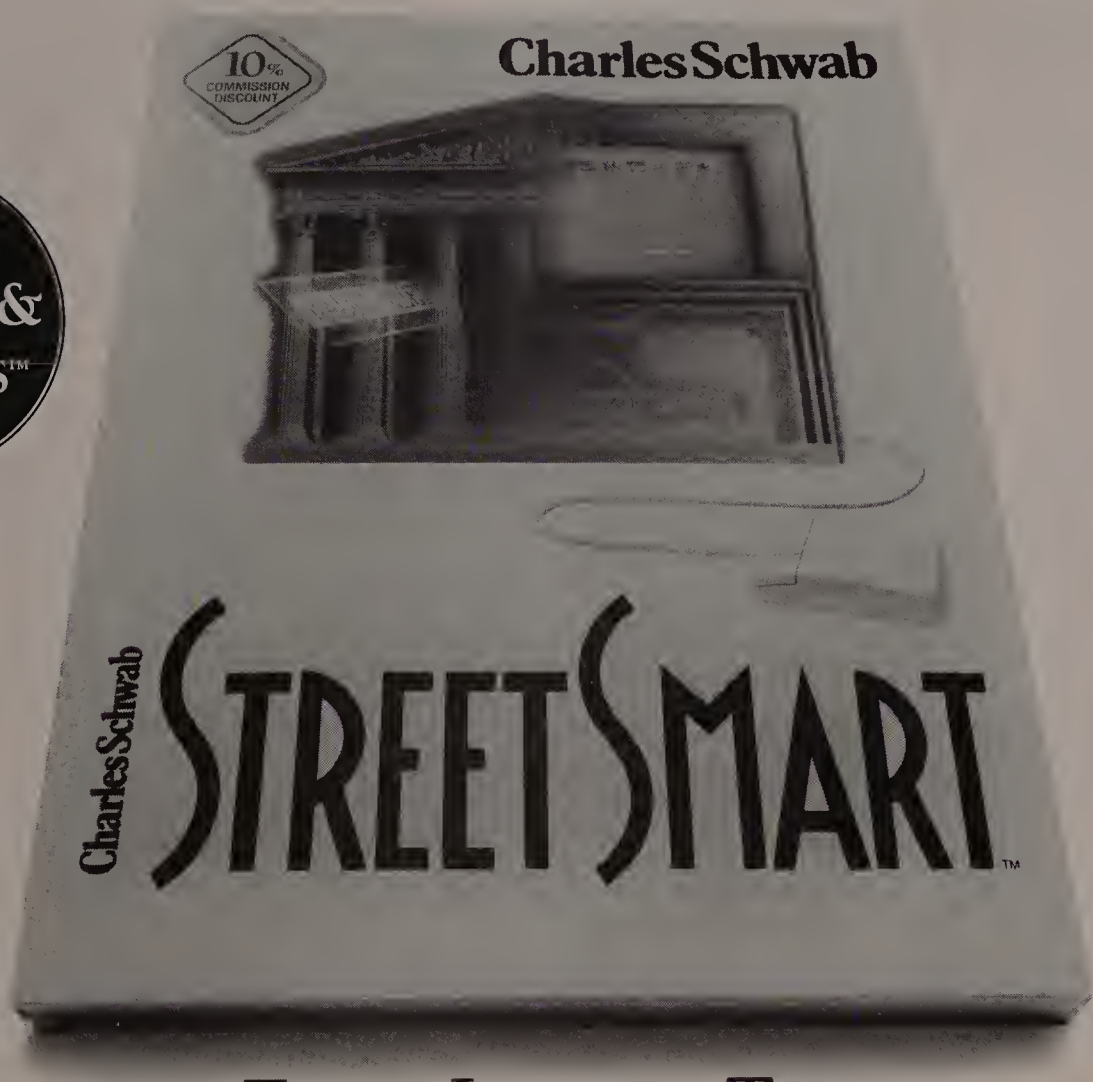
Under the new version of Windows, all 32-bit applications will run modularly. As a result, when you get an error message in one of these apps, you should be able to close just the offending program. Other 32-bit applications open at the same time should remain unaffected.

Unfortunately, this protection won't extend to older, 16-bit programs. If one 16-bit application crashes, any other 16-bit apps you have open could crash with it. So even after you upgrade to the next Windows, keep this article handy.

"The Best On-Line Trading Software I've Seen."

—Walter Mossberg,
in *SmartMoney* magazine
February 1994

Now For Mac® & Windows™



For a Limited Time, StreetSmart™ Can Be Yours FREE.

SmartMoney and other leading financial journals have acclaimed StreetSmart as a breakthrough in personal investment software. And now we've extended our special free offer.

Just move $15,000 or more into a Schwab account between May 2 and the end of October, and you'll get this powerful program—*free of charge.*

Manage your portfolio like a Wall Street broker.

With StreetSmart, you can research investments, place your own orders and monitor your accounts right from your computer—anytime day or night. Plus, you'll save an additional 10% on commissions.*

Trade up to Schwab today.

To help make more of your investment dollar work for you, trade up to Schwab where you can save up to 76%** on stock commissions.

And remember, to get today's "best on-line trading software" for free, open your account or transfer additional funds to Schwab before October 31, 1994. For help, stop by one of our 200 offices or call:

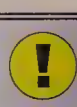
1-800-442-5111 ext. 89A

Charles Schwab

Helping Investors Help Themselves®

Offer available for individual investors only. Limit one per customer. *StreetSmart's 10% discount is based on Schwab's current commission schedule and may be used with other offers at Schwab's discretion. **Based on a 6/94 survey conducted by Schwab, available upon request. $39 minimum commission. Full-commission brokers may provide different services, including personalized securities recommendations. Commission rates surveyed are for stocks and may vary for other products. © 1994 Charles Schwab & Co., Inc. Member SIPC/NYSE. All rights reserved. (8/94)

Circle 103 on reader service card



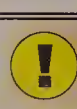
Access Denied

WHAT IT MEANS: This error most often appears in File Manager when you try to copy, move, or delete a file that File Manager senses is already open. The direct reason for the error is usually appended to the message. This error message will also pop up if the full path name of the file exceeds the 63-character limit (excluding backslashes).

WHAT TO DO NOW: *Close the file.* If the error message tells you 'the source file may be in use', switch to the app using the file and close the file. Return to File Manager and retry what you were doing when you got the error message.

WHAT TO DO IN THE FUTURE: *Get rid of duplicate directory names.* If the error message explains that 'The disk is full', it probably means you're trying to create a new directory (for instance, \STUFF) when you already have a file by the same name (in other words, Stuff) in the current directory.

Shorten your path names. If you have path names that are too long, rename the subdirectories to fit within the 63-character limit. In addition, you should consider performing a full-scale hard disk reorganization.



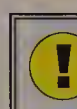
Parity Error

WHAT IT MEANS: This invariably indicates a hardware problem. Your PC checks its RAM for anomalies every time memory is read or written to. If a checks fails, the PC generates a parity error message.

WHAT TO DO NOW: *Exit Windows immediately.* Get out of Windows and search for the problem using the following methods.

WHAT TO DO IN THE FUTURE: *Eliminate software suspects.* Deactivate the memory-resident programs and device drivers contained in your CONFIG.SYS and AUTOEXEC.BAT files, then reboot. To deactivate a line, add two colons to the start of it; this prevents the line from executing. If all goes well, reinstate each TSR and driver, one at a time, until you re-create the problem. Unfortunately, data and code in Windows change memory locations constantly, so the parity error could appear one time and not another.

Locate bad SIMMs. The first step is to swap out memory chips until the problem disappears. Open up your PC, remove one of the SIMMs, restart your system, and see if Windows works. If it doesn't, you've found the faulty RAM. If it does work, swap out another SIMM, and repeat the process until you find the SIMM that caused the error. Of course, if you are not comfortable pulling out the vital organs of your computer, you'll need to get professional intervention.



An error has occurred in your application. If you choose Ignore, you should save your work in a new file. If you choose Close, your application will terminate.

WHAT IT MEANS: More than likely, you've run into an incompatibility between a Clipboard file and the installed video system. This happens, for example, when you try to view a high-resolution graphics image on a system that doesn't support that resolution. This message is sometimes followed by a 'General Protection Fault'. Another possible cause: The currently installed video driver can't handle a scrolling operation.

WHAT TO DO NOW: *Choose Ignore.* If this method works, save your work with a new file name immediately.

Choose Close. Use this if Ignore didn't do the trick. You will be returned to the Windows desktop. Open the Clipboard Viewer to see if your work is still there. If so, save it to a new file. Then quit and restart Windows to clean out the memory in use.

WHAT TO DO IN THE FUTURE: *Update VGA.DRV.* If the error occurs during scrolling, the fault lies with your current version of VGA.DRV. To test this, close all active programs in Windows. Press **<Print Screen>** to capture a full screen to the Clipboard. Next, open the Clipboard Viewer and maximize the screen. When you scroll to the end, your error message should pop up. If this happens, you need to reinstall VGA.DRV. Because the copy on your hard disk was somehow corrupted, try reloading the one that came with your original Windows disks. If this doesn't work, contact Microsoft to get a new copy of the file.

Michael S. Lasky is an associate editor for PC World.

Solutions After the Fact

From the Horse's Mouth

Microsoft has an extensive library of error message reports and solutions posted on its Microsoft Knowledge Base on CompuServe (GO MSKB). If you want to use the database, first download the document "Query Keywords for the Microsoft Knowledge Base." It also appears as Document Q96132, which is retrievable via Microsoft's fax-back service (call 800/426-9400).

The company also offers a comprehensive information service with its Microsoft TechNet, or Technical Information Network. Offered on CD ROM disks that are updated monthly, the virtual Microsoft library is available by subscription (call 800/344-2121).

The Error Bookshelf

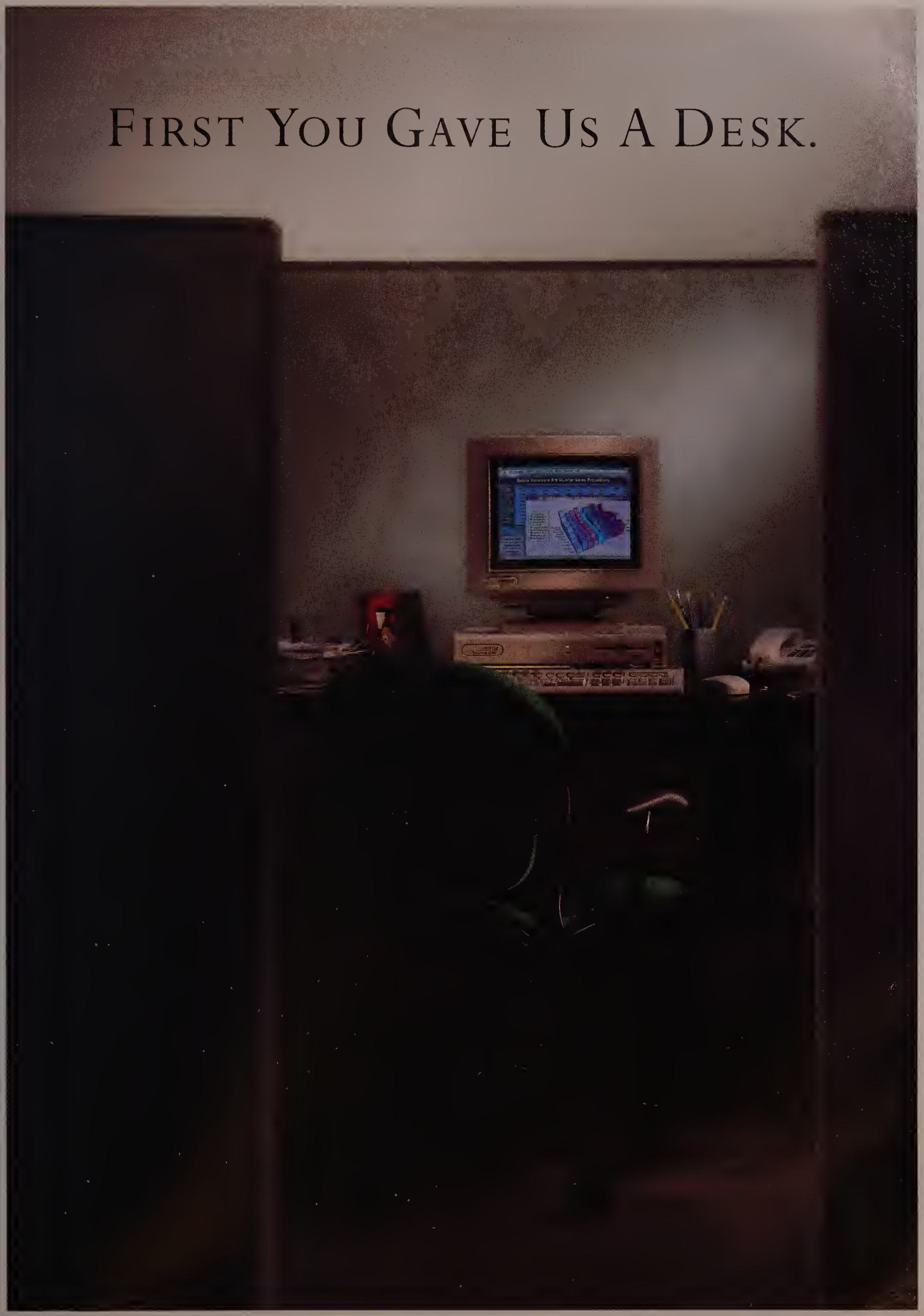
Few Windows books specifically cover error messages or even include the term *error message* in the index. Some, though, may still prove helpful when Windows crashes.

***Windows Configuration Handbook,* by John Woram (Random House, $34), offers an exhaustive appendix of error messages, with causes and remedies for each one. This volume is probably the single best source for error message diagnosis and treatment.**

***Windows for Dummies,* by Andy Rathbone (IDG Books, $16.95), devotes one chapter to error messages and covers only a limited number of them. But the errors discussed are those beginners are most likely to run into, and the information is clearly and simply presented.**

Catherine Murray's *S.O.S. for Windows* (IDG Books, $12.95) is filled with whimsical illustrations that add nothing to your knowledge. But the sidebars—with suggestions on how to deal with tech support people, definitions of technical terms, and step-by-step solutions—make the book a valuable troubleshooting resource.

First You Gave Us A Desk.



Now We Want To Ru

At Compaq, we know how much your people rely on information. After all, we've been working in your office for years. We also know that you're very serious about finding better and more efficient ways to handle information on a company-wide scale.

So, as your trusted PC company, we'd like to refer you to a solid, aggressive systems company: Compaq.

You may not be aware, but last year we provided over 63% of the world's superservers.[1] That's because our advanced systems can actually outperform mini-computers costing many times more, while delivering enterprise-class reliability. They can also radically cut per-transaction and maintenance costs.

Our experience, fueled by partnerships with such networking leaders as Novell, Microsoft and SCO, has helped us develop an integrated family of networking products – from the new ProSignia VS (which offers true server functionality at a desktop price) to the high-availability ProLiant line.

These systems can easily run today's emerging business-critical applications. They also reflect some refreshing common sense: Namely, there's no reason to downsize from big, complicated computers if you're

© 1994 Compaq Computer Corporation. All Rights Reserved. Compaq Registered U.S. Patent and Trade ark office. SmartStart and Compaq Insight Manager are registered traden a companies. Novell is a registered trademark of Novell Inc. Microsoft is a registered trademark of the Micr ft Corporation. The Intel Inside logo is a registered trademark of the Intel C controllers. For details, consult the Compaq Customer Support Center at 1-800-345-1518, select the PaqFa ption and request document #1270. For information on Insight Manager, request

The Whole Company.

going to end up with small, complicated computers.

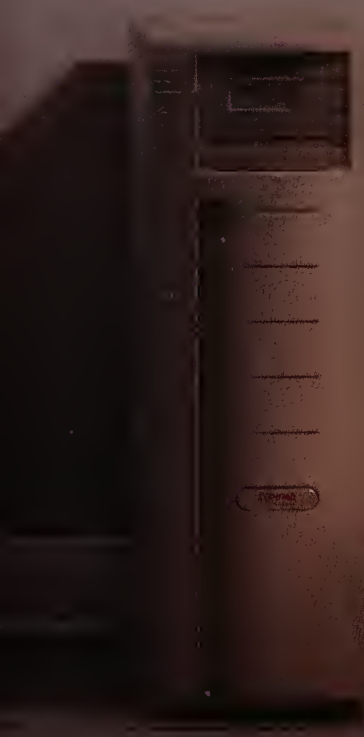
So Compaq's networking solutions bring you the same ease of use we've brought to the desktop. Our CD-based SmartStart technology vastly simplifies the most complicated part of the setup process — reliably configuring and fully optimizing your system.

Our servers are built to keep running, even when being serviced. The Compaq Insight Manager monitors 800 critical measurements of server health, and our Pre-Failure Warranty[2] ensures free replacement of key parts before potential problems turn into real ones.

And since you'd rather not use your business as a test lab, we use our test lab as a test lab. Here, in real-life, high-volume networks, we work with our industry partners to ensure the highest compatibility and keep our commitment to open systems. So you'll never be boxed in, forced to deal with any one manufacturer.

If you're interested in receiving specifications for Compaq systems immediately via fax, all you have to do is call us at 1-800-345-1518, choose the fax-on-demand option and request documents #4001 and #4004. And if you think we worked hard at the desktop, wait till you see what we do for you next.

COMPAQ



ProLiant are trademarks of the Compaq Computer Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. ©1993 International Data Corporation. [2]Requires Compaq Insight Manager 2.X and applicable only to advanced ECC memory and disk drives running under Compaq IDA, CDA or SMART configuration. For more information, request the product catalog.

Circle 47 on reader service card

"They Can Network Me.

Make Me Interactive.

Even put Me

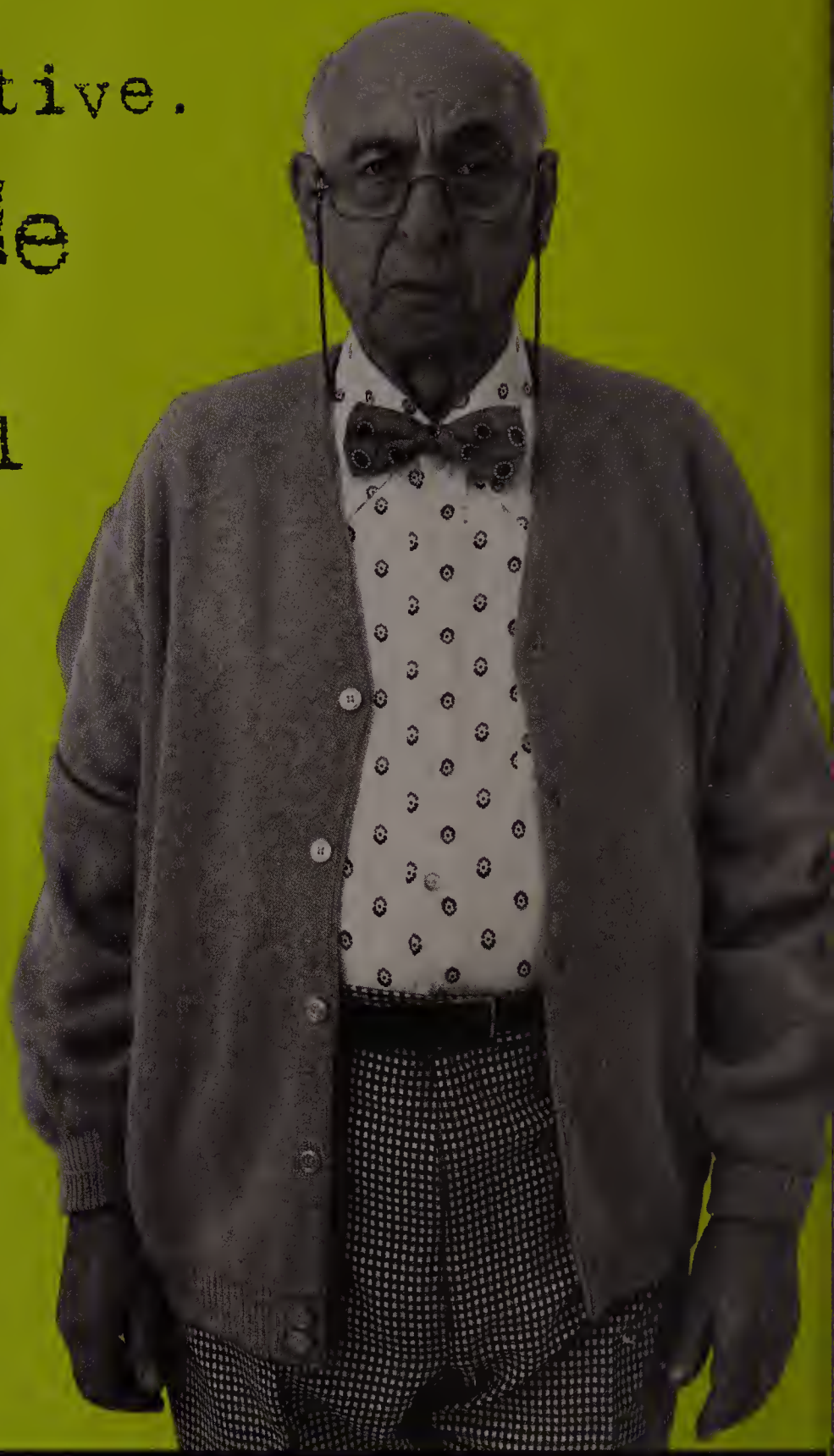
On Some Digital

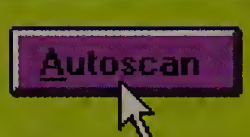
Expressway. Can't

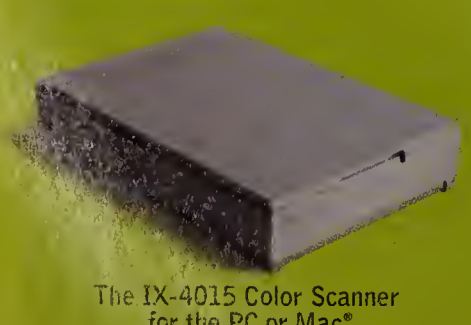
Someone just

Cure My

Scanaphobia?"







The IX-4015 Color Scanner
for the PC or Mac®

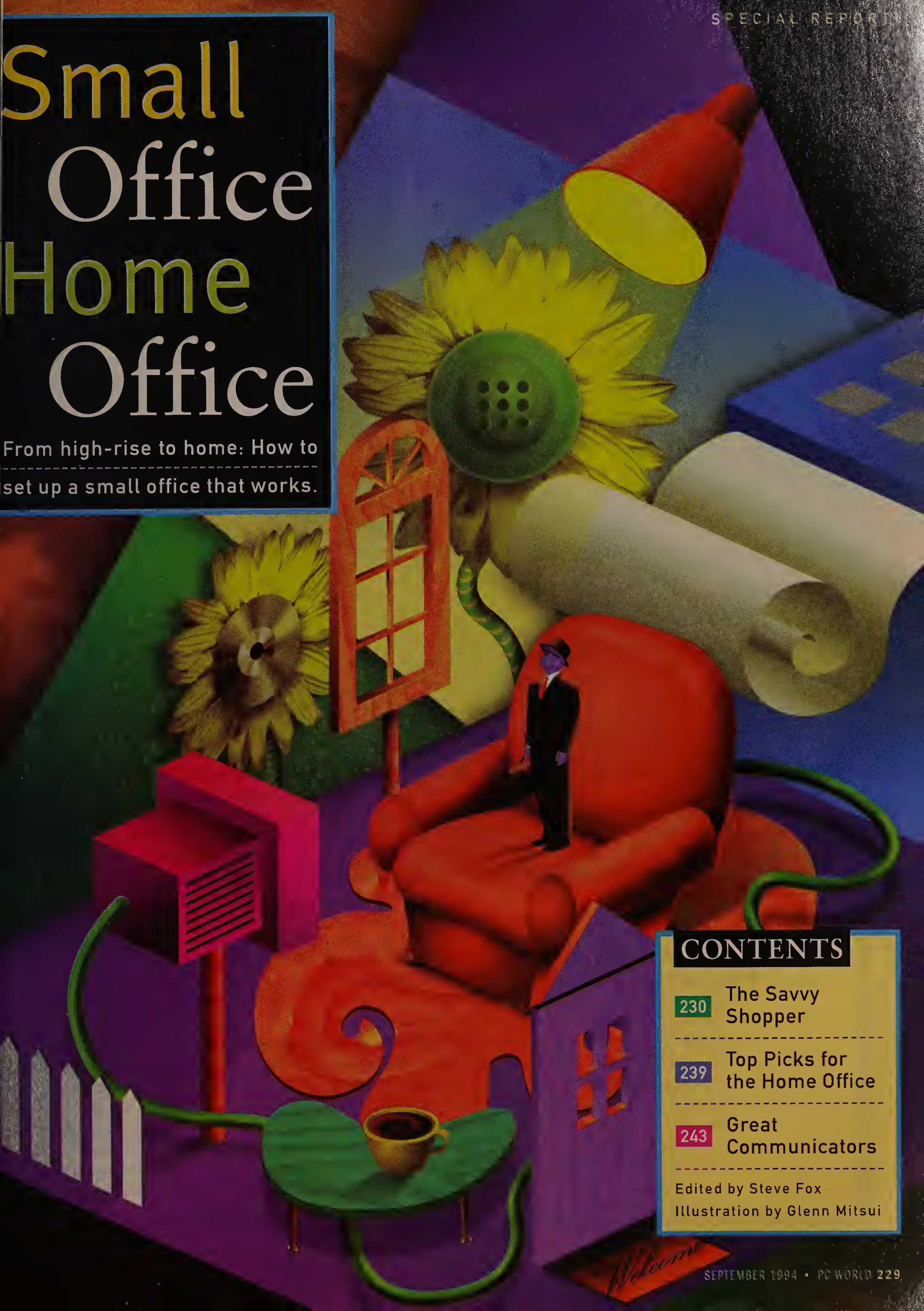
Yes. Introducing the Canon® IX-4015 Color Scanner. Its remarkable Autoscan feature produces professional quality scans in just one step. And with its easy to use OFOTO® version 2 software, small footprint, and affordable price, you'll find this powerful business tool a pleasure – not a pain. Now, we could load you up with all the great technical details, but that might scare you away. Instead, just see the IX-4015 at your local Canon dealer, or call us at 1-800-848-4123. Unless of course, you have "telephobia".

Canon

©1994 Canon Computer Systems Inc. Canon is a registered trademark of Canon Inc. All other registered trademarks are those of their respective companies. CCSI 2995 Redhill Ave., Costa Mesa, CA 92626. In Canada call (800) 263-1121.

Small Office Home Office

From high-rise to home: How to set up a small office that works.



CONTENTS

230 The Savvy Shopper

239 Top Picks for the Home Office

243 Great Communicators

Edited by Steve Fox

Illustration by Glenn Mitsui

Intrepid consumer Steve Bass knows how to spot a good deal when he sees one.

The Savvy Shopper

In the market for a new PC? Our shopper goes undercover in search of the best places to buy. By Steve Bass

SHOPPING FOR A NEW COMPUTER can be as scary as buying a new car—only worse. You worry about getting stuck with obsolete, underpowered equipment or being talked into an expensive system with more computing power than you'll ever need. To make things more confusing, computers are sold practically everywhere nowadays: computer superstores, office supply stores, discount warehouse clubs, consumer electronics outlets, and even traditional mass merchants such as Sears and Montgomery Ward. What's next, your local 7-Eleven?

The question is, which kind of store is right for you? To find out, *PC World* sent me shopping. My assignment: Visit the most popular stores in Southern California that sell computers and pretend to buy a system. I'd play the part of an average user setting up a new home office desktop publishing service. I'd say I want a PC to run PageMaker, PowerPoint, CorelDraw, and Word for Windows; to manage the business, I might add Quicken and Excel in the future. My disguise? I put on a shirt and tie and tried not to look like a propeller-head.

I'd tell salespeople that I'd researched my purchase in computer magazines and wanted a PC with 2MB of RAM, a 100MB hard drive, and a 2400-bits-per-second (bps) fax-modem. This little fiction was designed to test their acumen: 2MB isn't enough RAM to run Windows, a 100MB hard disk is too small to hold large graphics files and today's space-hogging applications, and 2400-bps modems are outmoded.

Sure, it was a sting, but if Mike Wallace can do it, so can I.

Computer Superstores

My first stop was CompUSA. It was Saturday afternoon and the place was jammed; parking alone took ten minutes. Once inside, trudging past aisles of software and PC peripherals, I faced rows of Dells, Compaqs, Packard Bells, and Compudynes, CompUSA's house brand.

I nabbed a staffer named Derrick and told him my story. In return, he gave me an earful of advice about what I'd need on my desktop and about computers in general. Right off the bat, he told me I needed a system with more muscle. He went on, outlining the system I needed component by component. His recommendations for CPU speed, amount of RAM, and hard disk size were all on target.

Ultimately, he recommended the house brand, a Compudyne system, and told me that if I wanted to add a tape backup or a multimedia kit, they'd install it at no charge. The only time I felt I was getting a hard sell was when he told me—with complete sincerity—that Compudyne systems use higher-quality

components than those from other, pricier manufacturers. Yeah, sure. As for CompUSA's pricing, while I didn't see any bargains, I didn't feel like I was getting gouged.

With one computer superstore under my belt, I hopped back onto the freeway to check out my local Micro Center, a 50,000-square-foot store filled with some 23,000 products. I had no trouble finding a salesperson, and he knew his stuff. He acted more like a user group member taking a novice under his wing than a pushy salesperson earning a living. Instead of buying Microsoft Word for Windows and PowerPoint separately, he pointed out, I could save a bundle by buying Microsoft's Office, and I'd get a copy of Excel in the bargain. Good advice. Then he helped me find a reasonably priced multimedia system from Micro Center's own line of PCs: The 486DX2-50 included 8MB of RAM, a 340MB hard disk, a 15-inch monitor, a CD ROM drive, and a sound card—all for about $1750.

Micro Center proved to be as good a shopping experience as CompUSA. I'd feel safe sending my mom either place—as long as I went with her.

Office Supply Stores

Colossal office supply stores like Office Depot carry everything from rubber bands and paper clips to copying machines and phone systems. These stores also claim to stock thousands of PC products, but the two I visited proved lacking. When I stopped by my local Office Depot, for example, I found just one lonely Compaq Presario and a handful of Packard Bells. According to the salesperson, the last IBM had been sold the week before and a new shipment, including some IBM ThinkPad notebooks, was on the way. I must admit the collection of Macs was excellent (too bad I don't write for *Macworld*).

Office Depot's skimpy selection was a shame, because the store's in-house computer evangelist was knowledgeable and eager to help.

What's in Store: Comparison Shopping

So what's the best place to buy PCs, printers, software, and the like? Our top pick goes to the computer superstores, with warehouse clubs running a close second. If you're skilled at fending off predatory salespeople, consumer electronics store are a reasonable option. Office supply stores, because they offer one-stop shopping, come in fourth, while mass merchants have the dubious distinction of being our least favorite venue for PC purchasing. For the sake of comparison, we've also listed the pros and cons of buying mail order.

Computer Superstores

PROS: The best selection of PCs and peripherals, reasonable prices, plenty of knowledgeable salespeople, and in-house service and tech support departments. And they'll custom-configure your system.
CONS: Sales staff may be on commission (they aren't at CompUSA, but they are at Micro Center), so watch yourself.

Warehouse Clubs

PROS: Pricing and customer assistance can be quite good. And you can buy paper towels and PCs in one stop.
CONS: Selection is meager. The stores we visited had only two brands of PC (albeit Dell and Compaq), plus software, printers, fax-modems, and graphics boards. No in-house service or tech support.

Consumer Electronics Stores

PROS: Generally good selection of PCs and, in some stores, peripherals, for okay prices. Salespeople can be good, though not all are. Some stores may have an in-house service department.
CONS: High-pressure, commissioned salespeople. Hard to obtain sales literature. No in-house tech support.

Office Supply Stores

PROS: Pricing is competitive with that of computer superstores. Small office/home office denizens can equip an entire office in one shopping trip. Sales staff can be excellent.
CONS: The selection of PCs is narrow. In stores we visited, choices were limited to two or three brands. Sales staff is small and its quality is hit-or-miss. Many stores lack in-house service departments.

Mass Merchants

PROS: Sales staff is well-trained in customer relations. Plentiful literature; in-house service departments.
CONS: The PC departments seem like afterthoughts: The selection of PCs is poor, and there are often gaping holes in salespeople's computer knowledge.

Mail Order

PROS: Great prices, wide selection. Vendors will generally customize your system's configuration to meet your specifications.
CONS: You'll have to wait for your PC to arrive in the mail, and you can't take a look at your purchase before you buy.

—Dan Miller

Admitting to dismay at the store's slim pickings, he did a decent job of describing what little stock he had. As I played dumb, he let me pick his brain for 40 minutes with dozens of questions. The only dubious advice: He recommended I try Microsoft's Publisher rather than PageMaker because "it's easier to learn"—true enough, but no professional DTPer would run a business using a low-end package like Publisher.

The selection at Staples, the other office supply store I shopped, was worse than at Office Depot: a solitary Compaq 486DX-50 and two low-end Packard Bells. The salesperson, bless his inaccurate heart, warned me away from computers with SX chips because "if you do serious drawing, like hard-core graphics, you'll need a DX." I see. He recommended the Compaq because, among other things, it has extra slots so I can "put in a video card or a color card." Next.

Warehouse Clubs

Next in line was Price Club, the giant discount warehouse club. After all, I needed to pick up a sack of dog food and a case of laundry detergent anyway, so why not look for a computer while I was there?

The first Price Club I visited sold only two brands of PCs—Dell and Compaq—and the selection of these was pretty spare. As I walked past the sample systems—plugged in and working, stacks of literature nearby—my attention kept drifting over to *All My Children* playing on the TVs in the next aisle. During commercials, I discovered a Dell multimedia system—a 33-MHz 486DX with 4MB of RAM, a 230MB hard disk, a double-speed CD

Retail Details: From Superstore to Mail Order

	Number of computer products sold [1]	Computer brands	Custom-configured systems [2]
COMPUTER SUPERSTORES			
CompUSA 800/266-7872	5000 [3]	Apple, AST, Compaq, Compudyne, Dell, Epson, Hewlett-Packard, IBM, Packard Bell, Toshiba	Y [4]
Micro Center 614/481-8041	23,000	Apple, AT&T, Compaq, Hewlett-Packard, IBM, Laser, NEC, PowerSpec, Toshiba, WinBook (Micro Electronics)	Y
OFFICE SUPPLY STORES			
Office Depot 800/685-8800	3000	Apple, Compaq, IBM, Packard Bell, Toshiba	N
Staples contact your local store	n/a [5]	Compaq, Packard Bell	N
WAREHOUSE CLUBS			
Price Club/Costco 800/774-2678	40–45	Compaq, Dell	N
CONSUMER ELECTRONIC STORES			
Circuit City 800/251-2665	200–500	Apple, AST, Compaq, IBM, Packard Bell, Toshiba	N
Good Guys 415/615-5000	n/a [5]	Acer, Apple, AST, Compaq, Epson, IBM, Leading Edge, Packard Bell	N
MASS MERCHANTS			
Montgomery Ward contact your local store	200–300	Apple, Compaq, IBM, Packard Bell, Pionex	N
Sears contact your local store	200–250	Apple, AT&T, Epson, IBM, Packard Bell	N
MAIL ORDER			
Dell Computer Corp. 800/433-8110	n/a [5]	Dell	Y
Gateway 2000 800/846-2065	n/a [5]	Gateway	Y

[1] As measured in stock keeping units (SKUs). [2] Options include extra RAM, a larger hard drive, and a CD ROM or tape drive.

[3] Can special-order an additional 40,000 items. [4] Compudyne house brand only. [5] Company does not divulge SKUs.

ROM drive, sound, speakers, and a 14-inch monitor—all for a reasonable $1899. The multimedia Compaq Presario 833 CDS, based on a 33-MHz 486SX, was selling for $1599, about $100 less than I'd seen it elsewhere.

I looked around for some help. Frankly, I wasn't expecting much in the way of customer service. But while I was fiddling with the Presario, I bumped into a salesperson who really knew computers.

After hearing my story, he explained that the Dell, while more expensive, would be best because of its speed. But the Compaq has a modem, I told him; isn't that good? "It runs at only 2400 baud, and that's old technology," he pointed out, correctly. "And unless you plan on going online right away, you can wait a while and put a faster, 14.4-bps fax-modem into the Dell," he suggested. Made sense to me.

I needed to pick up some dog food and a case of laundry detergent anyway. Why not look for a PC while I was there?

PC sales staff per store	Commissioned sales staff	Money-back guarantee	In-house service	In-house support
20	N	Y	Y	Y
100	Y	Y	Y	Y
2	N	Y	N	Y
1-5	N	Y	N	N
1-5	N	Y	N	N
4	Y	Y	Y	N
2	Y	Y	N	N
1-5	Y	Y	Y	N
1-5	Y	Y	Y	N
n/a	N	Y	N	Y
n/a	Y	Y	Y	Y

And this store was no fluke. I tried a different Price Club the following week (I needed more dog food). They had the same Compaqs and Dells as the first store, with two more powerful models on display. And the salesperson had the same patient approach and level of competence.

If you're willing to try Price Club, you can expect good prices but few choices. Just remember: If you see a system you want, buy it fast, because what's in stock today may be discontinued tomorrow. On a third shopping trip two weeks later, the Presario 833 was no longer available.

Consumer Electronics Stores

I knew from past shopping trips that the name of the game at Circuit City is "commissioned sales." As I made my way past the refrigerators and into the computer section, a guy who looked suspiciously like a used car salesman sidled up to me and asked if I needed help. He gave me a minute to explain the needs of my incipient business and then proceeded to demonstrate the virtues of a CD ROM–based encyclopedia. I asked him to look up *perfunctory*.

I managed to dislodge myself from the encyclopedia demo and started to examine some of the systems. Circuit City has PCs from lots of vendors—like Packard Bell, AST, IBM, and Compaq—each in a variety of models. Better yet, prices are reasonable, and the store guarantees to beat any local store's price (of course, you'll have to find the exact same configuration—good luck). Unfortunately, sales literature is difficult to come by. Most of it is laminated and attached to the shelf, and it takes an act of Congress to get it photocopied.

By now, another salesperson was circling. This one actually paid attention to what I had to say. He recommended an AST 486SX-33. I asked if a DX2-50 might not be better for

OVER TWO MILLION LOTU
LIVES A LOT EASIER. THEY SW

Every day more people are jumping the fence to the most popular spreadsheet ever. In fact, over 10 million people are now taking advantage of the intuitive power of Microsoft® Excel.

The TipWizard™ assistant tracks your work and offers custom shortcuts.

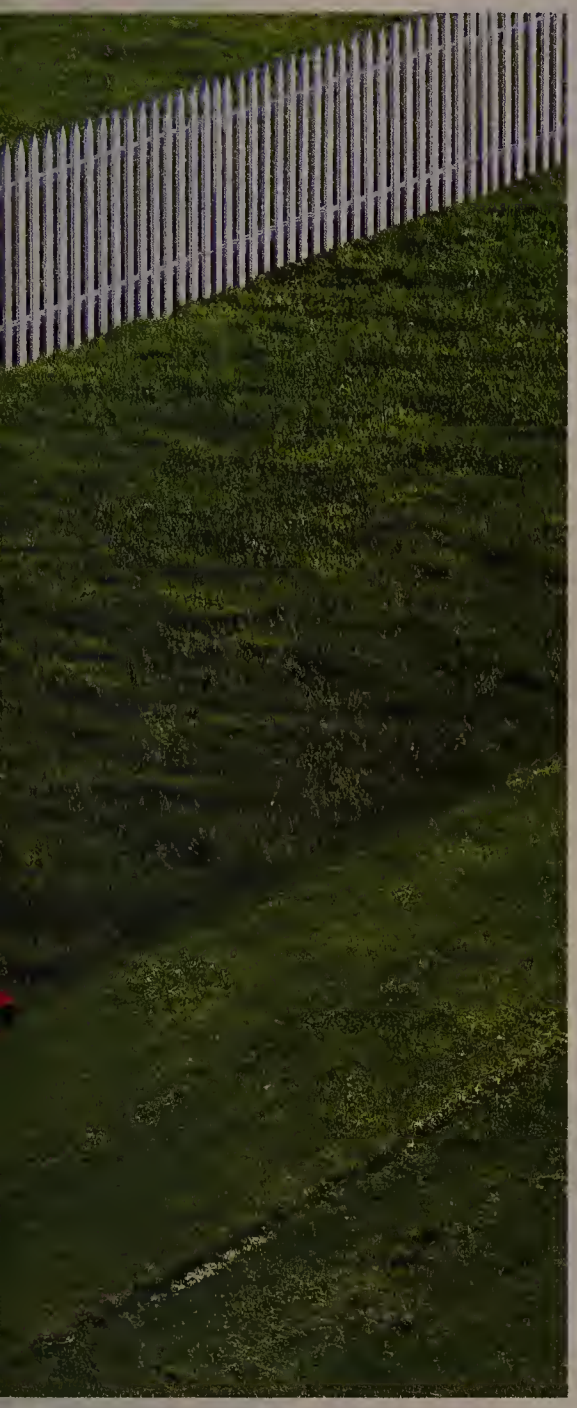
It's just the smart thing to do. Microsoft Excel 5.0 is the only spreadsheet with built-in intelligence – our exclusive IntelliSense™ technology. So, like everything in the Microsoft Office, this program understands what you're doing and helps you get there with a lot less work. Simple tasks are automatic, more complex jobs are a breeze.

Say that you want to browse through all your data to find some sales totals. Click. AutoFilter shows you just what you want.

You can add those totals automatically with the Subtotal feature.

*Microsoft support is no-charge; however, normal telephone company charges may apply. Microsoft support services are subject to Microsoft's then-current prices, terms, and conditions, and subject to change without notice. Microsoft separately). In the 50 United States, call (800) 894-6642, Dept. 6SP. In Canada, for information only, call (800) 563-9048. Outside the U.S. and Canada, call your local Microsoft subsidiary or (206) 936-8661. Customers who are deaf the Windows logo are registered trademarks and IntelliSense, TipWizard, PivotTable and Windows are trademarks of Microsoft Corporation. Lotus and 1-2-3 are registered trademarks of the Lotus Development Corporation.

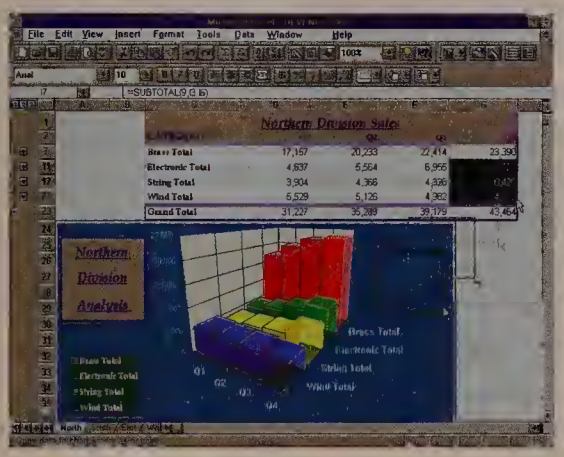
USERS JUST MADE THEIR TCHED TO MICROSOFT EXCEL.



Then expand or collapse the details of your worksheet with the Outlining buttons. Instantly. Like no other spreadsheet can.

Think about the analysis you do. Only Microsoft Excel gives you such easy, powerful access to information. With our PivotTable™ Wizard, it's a cinch to pull your raw facts into a clear summary report.

Then, with the PivotTable dynamic views, you can look at data



Instantly update your charts with Drag-and-Plot. Just drag in new data and you're done.

from different points of view—by product, region, quarter, whatever. Just drag and drop different headings to rearrange your report. As you go, your figures are immediately recalculated. So you see them in a whole new way.

Of course, Microsoft Excel is another smooth-fitting piece of the Microsoft Office, where the programs work together like one.

After creating a table or chart in Microsoft Excel, you can just drag and drop your work into Word.

Any time you want to make changes, one click puts all of your spreadsheet tools back in action. Without leaving your document.

It's this OfficeLinks integration that lets you focus on your work, not on finding the tools you need.

Microsoft Excel customers get the best support around. Bar none. Furthermore, the programs in the Microsoft Office come with the only unlimited product support that has no service charge.*

And if you're a former Lotus® 1-2-3® user, relax. You can directly transfer files, even run existing macros. Easily. Enter a Lotus command and the Help for Lotus users feature lets you automatically see the Microsoft Excel equivalent.

So swing by your nearest dealer or call us at (800) 894-6642, Dept. 6SP. You'll see why the grass is greener on this side of the fence.

Microsoft Office

essional, shown here, includes: Microsoft Excel, Word, the PowerPoint® presentation graphics program and the Microsoft Access® database management system and a Mail workstation license (server and software must be acquired earing can reach Microsoft text telephone (TT/TDD) services by calling (800) 892-5234 in the United States or (905) 568-9641 in Canada. © 1994 Microsoft Corporation. All rights reserved. Microsoft, Microsoft Access, PowerPoint and

me. "Nope," he explained. "But if you're doing desktop publishing, you'll be happier with a 17-inch monitor. And lemme tell ya 'bout our extended warranty..." Want to bet he's on commission?

My next stop on the electronics circuit was The Good Guys. The first thing the salesperson wanted to know was, "What're you going to do with it?" The question nearly brought tears to my eyes. Wait, it got better. Jeff walked me through each component of Acer's 4571G. "The 340MB hard disk has about 100MB of installed applications, so even with your new programs, you'll have plenty of space left for data." How about speed? "Get at least a 33-MHz DX—you'll be unhappy with a slower SX. Put your money into more RAM—about 4MB more—instead of a 50-MHz processor."

His sales pitch was so convincing, I almost found myself reaching for my Visa. (The prices were on a par with the other stores I shopped.) Now I know why it's called The Good Guys.

Would I recommend buying a PC at an electronics boutique? Yes, as long as you stay wary and do your homework first. And if a salesperson comes on too strong—or can't answer all your questions—head for the door. Unless, of course, you really do need that new refrigerator.

Mass Merchants

I didn't expect to find anything innovative or exciting in Sears' PC department—and I was right. Plenty of Packard Bells and a few IBMs. The sales force consisted of one poor soul trying to take money at the register and answer the telephone while fielding my barrage of questions (okay, I felt a *little* guilty).

I headed over to the gardening center for a while, giving the guy time to catch up. When I got back, I went through my song and dance. This time I got some real Sears service. He grabbed literature, jotted down the price of each system, and explained the components of each computer. Nice work. But he wasn't familiar enough with the software I planned to use to realistically gauge the best system for my needs. At least he was honest enough to admit his ignorance.

Montgomery Ward was no better. The store I visited carried two IBM PS/1s and the now ubiquitous Packard Bell. I tried my darndest to get the salesperson to figure out the system best for me. All the conversation got me was a listing of each computer's specs, and, at that, he wasn't clear.

"Does the Packard Bell have enough room for my software?" I asked adroitly.

"Yep, it comes with 270MB of memory," he replied. I considered giving him a quick tutorial on the difference between memory and hard disk space, but managed to resist.

"Er, can the store customize any of these systems?" I tried.

"Nope," he said.

The good news: I got a cool pair of Reeboks—on sale.

The big retailers are great for certain things—shopping for a wrench set at Sears is one of life's little pleasures. But are they good places to buy computers? Not until they start putting DX2s on radial-arm saws.

The Bottom Line

I shopped until I dropped, talked with lots of salespeople and scribbled plenty of notes. What did I learn? That if you really *are* looking for a PC, you don't have to fret.

If you live in a big city, you have plenty of choices. At the top of my list are the computer superstores: They're dedicated to selling computers and everything that goes

SEE TO IT THAT THE PRINTER YOU CHOOSE T

Insist upon a printer with genuine Adobe™ PostScript™ software inside. It's the industry standard and the only way to guarantee that your printer will work with virtually every software application and hardware environment, today and tomorrow. Adobe PostScript software sets the standard for new color and network printers. In fact, leading printer manufacturers offer over 300 Adobe PostScript printers. Adobe PostScript is your assurance of the highest-quality output—every time—whether you're printing from DOS, Windows™, OS/2®, Macintosh®, or UNIX®. So if

SET YOUR SIGHTS ON GENUINE ADOBE POSTSCRIPT DEVICES

with a system. Each superstore I visited had a great selection, with everything in stock. The salespeople were a well-trained bunch who never pressured me. Next, I'd suggest a warehouse club like Price Club/Costco. You can save a little money, as long as you know what you want and you can tolerate the mediocre selection.

Choice three is a consumer electronics store. The selection is generally good and the prices are okay. Again, you have to know what you want, because the quality of the sales help is unpredictable.

The office supply stores were disappointing. Even though system prices are reasonable and I found a well-trained salesperson at Office Depot, there wasn't much to choose from. My advice is to steer clear. At the bottom of my list are the mass merchants—Sears and Montgomery Ward. The PC departments felt like afterthoughts.

How do these outlets compare with mail order? You can get better prices, great selection and often some customizing when you shop by phone. But you can't *see* equipment you're buying. The other problem with mail order: You have to wait for your PC to arrive in the mail. Buying locally means you can pick up your PC in the morning and be playing Minesweeper that afternoon.

I knew from past shopping trips that the name of the game at Circuit City is "commissioned sales."

You can also buy from a local mom-and-pop computer shop. At their best, local shops offer friendly, expert advice and custom-configured systems. Still, even the best of them have trouble competing with the bigger outlets on pricing or selection. If you can get a solid recommendation for a trustworthy local store that's been in business for a while, give it a whirl. If the prices are too rich or the brand selection too thin, you can always head for a chain.

One final note: If you want advice on choosing a PC outlet in your area, consider joining a local computer user group and then asking members for recommendations. You might even get someone to take you along on a shopping excursion. You can find a user group in your area by calling the Association of Personal Computer User Groups' locator number (914/876-6678), by looking for user group listings in local computer mags like *Computer Currents,* or by checking out the *Consumer Watch* column in the October 1993 issue of *PC World.*

As for me, well, I'm getting back into a T-shirt and heading out to Price Club. Looks like I'm outta dog food again.

Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. Dan Miller is an associate editor for **PC World.** ■

AY IS THE PRINTER YOU'LL USE TOMORROW.

you're anyone from a small business owner to a professional publisher, an Adobe PostScript printer is the best long term value for your company, today and tomorrow. For a free guide on how to choose a printer, call 1-800-833-6687, Dept F, Ext. 1606.

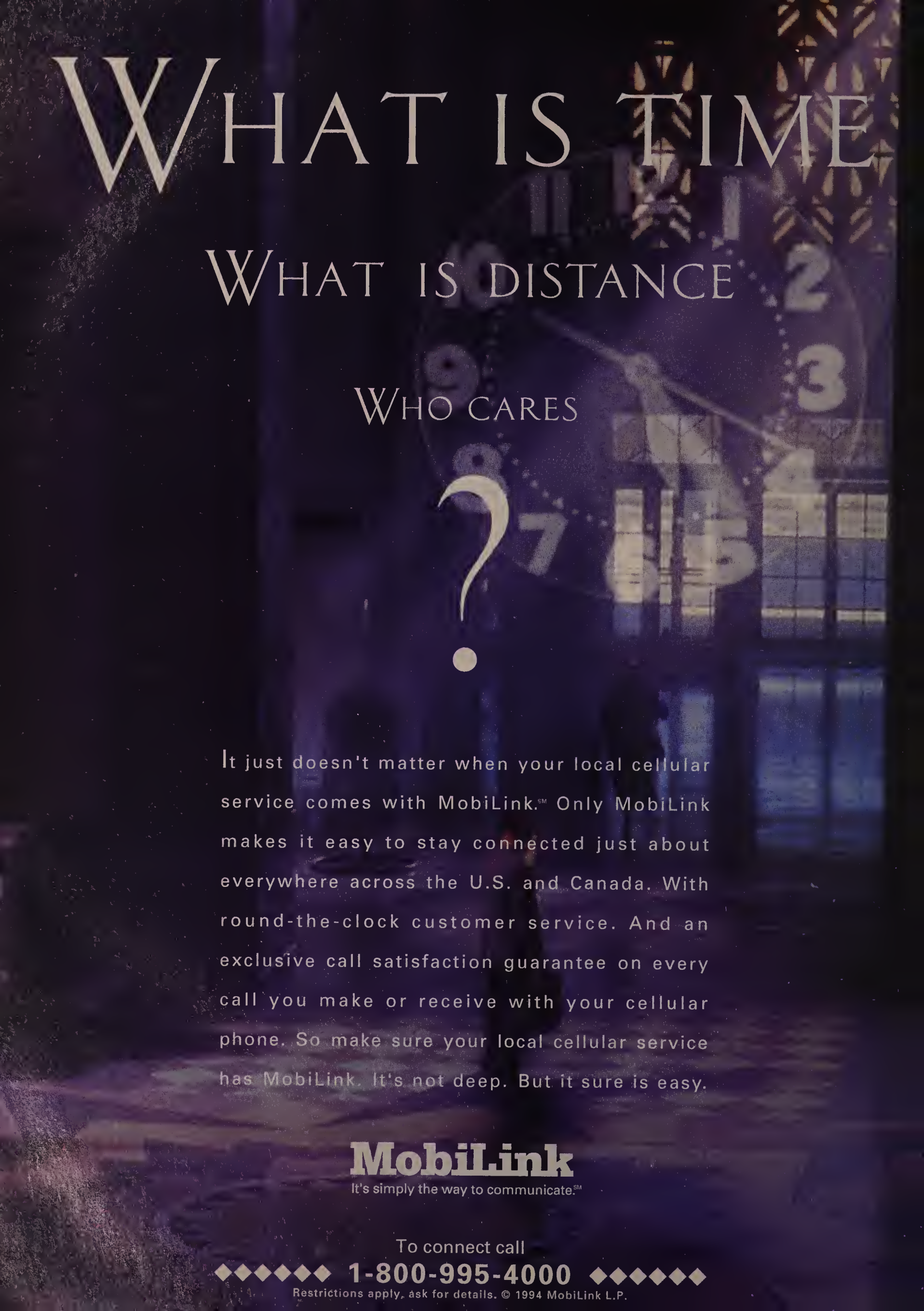
Adobe

IT'S NOT JUST PRINTING,
IT'S ADOBE POSTSCRIPT PRINTING.

Adobe, the Adobe logo, PostScript, the PostScript logo and the tagline, "It's not just printing, it's Adobe PostScript printing" are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other marks and trademarks are the property of their respective companies. ©1994 Adobe Systems Incorporated. All rights reserved.

LACK-AND-WHITE, COLOR, NETWORK AND FAX PRINTERS.

Circle 23 on reader service card


WHAT IS TIME
WHAT IS DISTANCE
WHO CARES
?
It just doesn't matter when your local cellular service comes with MobiLink.SM Only MobiLink makes it easy to stay connected just about everywhere across the U.S. and Canada. With round-the-clock customer service. And an exclusive call satisfaction guarantee on every call you make or receive with your cellular phone. So make sure your local cellular service has MobiLink. It's not deep. But it sure is easy.
MobiLink
It's simply the way to communicate.SM
To connect call
1-800-995-4000
Restrictions apply, ask for details. © 1994 MobiLink L.P.

Top Picks for the Home Office

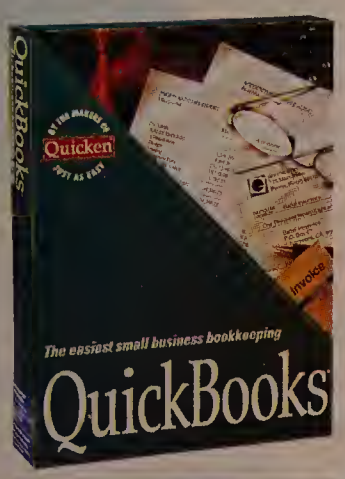
These are a few of our favorite things. By Steve Bass

Panasonic's KX-F390 is an answering machine, fax machine, and cordless phone.

LOOKING FOR GOOD PRODUCTS at reasonable prices? Here's a sampling of some topflight tools.

Home Office Bottom Lines

Okay, I'll admit it: I've never been a big accounting fan. But with Intuit's QuickBooks 2.0 for Windows, even I look forward to a bookkeeping session. That's because QuickBooks not only takes care of check writing, accounts payable and receivable, and the usual accounting tasks, it also features exceptional business management tools. The program's graphs give you a quick visual look at the status of, say, your receivables, or you can monitor your income and expenses in the form of a pie chart. Even better, it enables you to zoom in on behind-the-scenes details by clicking any portion of a graph. For a street price of about $95, QuickBooks also offers insight into your business, with reports that forecast cash flow and determine your company's up-to-the-minute net worth. Now, if only QuickBooks had an ATM option for dispensing $20 bills from the floppy drive. *QuickBooks 2.0 for Windows $159.95; Intuit; 800/624-8742.* **Reader service no. 605**



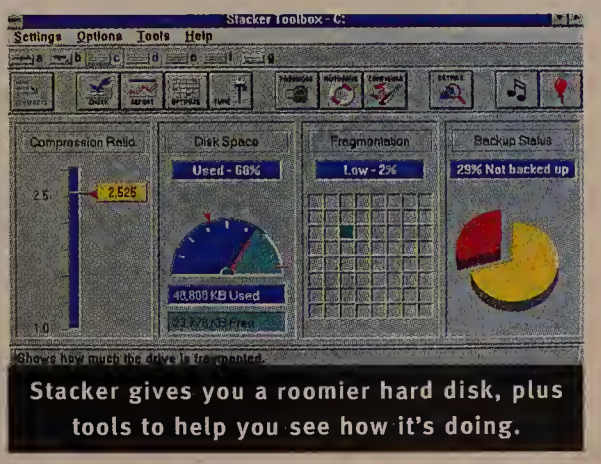
QuickBooks keeps your books and forecasts your cash flow.

A Cordless Combo

If you're planning to open a small office, you know you'll need a fax machine. But you'll also undoubtedly need an answering machine—and don't you want the convenience of a cordless phone? Well, it gets easier all the time with Panasonic's new KX-F390 integrated system. It has everything you want, including the latest cordless phone technology: 900-MHz range for clearer reception at longer distances. Privacy Ring enables the unit to recognize numbers you've entered into memory and identifies the call with a special ring pattern. The KX-F390 saves you money by letting you print fax documents in half-size, reducing thermal paper use. And the unit's ten-page document feeder lets you set the unit to delay faxes until off-peak hours, when long-distance charges are considerably lower. *KX-F390 $1299.95; Panasonic; 201/348-9090.* **Reader service no. 606**

Wring Out a Few More Bytes

Remember when you first bought that 200MB hard drive? I'll bet it's almost full and you're considering upgrading. But before you touch that screwdriver, take a look at Stacker 4.0 for Windows: For around $100 on the street—lots less than a new hard drive—this disk compression program can double your hard disk space. I more than doubled the size of my 230MB hard drive—a mind-expanding experience. Now you can finally load that 18MB screen saver. In addition, the program's Windows Toolbox lets you optimize and fine-tune your compressed disk, and it alerts you to changes in the disk's condition. For safety's sake, Stacker also maintains duplicate sets of important system files on uncompressed portions of your hard disk. *Stacker 4.0 for Windows $149; Stac Electronics; 800/522-7822, 619/431-7474, 619/431-0880 (fax).* **Reader service no. 607**



Stacker gives you a roomier hard disk, plus tools to help you see how it's doing.

Achy Breaky

Tired of schlepping your handset from the phone to your ear? Achy from squeezing your shoulder against your neck with the phone wedged between? Try a headset from Plantronics. It's small and lightweight—about 3.5 inches and just half an ounce—and fits snugly into

TOP PHOTO: ROBERT CARDIN

PaperMax is a small, fast scanner that springs to life when you feed it paper.

one ear. The headphone connects to both external and internal modems as well as fax-modem cards.

If you prefer to use a headset that loops around your head, you can choose the Supra Headset and plug it directly into your desktop phone. *CompuSet $99.95, Supra $196; Plantronics; 800/544-4660, 408/426-5858.* **Reader service no. 608**

Big League Marketing From Home

Got a hot product to sell but no big bucks for a marketing firm? If you have a CD ROM drive, Pro CD's Direct Phone can give you unlimited and inexpensive access to some top-of-the-line marketing information. Direct Phone is a two-CD set with a complete residential directory for the entire country packed on one disk, and listings for all businesses on the other.

For a street price of less than $100, you can plot businesses by town, phone number, area code, prefix, or type of business, then export the data to your favorite spreadsheet or word processor. Especially useful for direct mail and telemarketing. *Direct Phone $149; Pro CD; 800/992-3766, 508/750-0000, 508/750-0070 (fax).* **Reader service no. 610**

Pro CD's Direct Phone gives you unlimited access to primo marketing information.

Scanning the Horizon

Ever need to copy an insurance form quickly? Or convert a paper document into something you can fax directly from your computer? Then you'll want to check out PaperMax and MaxMate for Windows, an exquisitely integrated scanner/software combination.

The PaperMax is a compact 3-by-3.75-by-12.5 inch scanner that hooks into your PC's serial port. Insert a sheet of your document, and the PaperMax springs to life, scanning the page in seconds. Then, in less time than it takes to say *paperless office,* the scanned image pops up on screen in the companion MaxMate application, which lets you rotate, zoom, annotate, and touch up the image. You can even combine multiple documents—for example, all your bills—into one file. The scanned black-and-white image is slightly better than standard fax quality, although not good enough for desktop publishing. But at $499 list, you wouldn't really expect it to be. *PaperMax with MaxMate for Windows $499; Visioneer; 800/787-7007, 415/493-9599.* **Reader service no. 609**

Desktop Holdings

Is your desktop real estate at a premium? Multiform Products has some nifty gadgets designed to lift and swivel and raise your electronic devices uptown. You can put your phone atop a telescoping arm that swings out of the way when you don't need it.

Next, you can raise the monitor to eye level with the Tandem 1 raised desktop. This extra platform clamps onto your desk, adding more than 3 square feet of work space and supporting up to 110 pounds, so you can keep your fax or answering machine aloft as well. Once the platform is attached and locked into place, a unique swivel device lets you pull the unit closer to you, push it back, or rotate it 90 degrees to the left or the right from the front. *Telescoping Arm $114.95, Tandem 1 $329.95; Multiform Products; 800/382-8113.* **Reader service no. 611**

On the Road Again

Want to keep a computer by your side without throwing out your back or your budget? Just power up Hewlett-Packard's OmniBook 530 PC, a 3-pound 33-MHz 486SX subnotebook. The OmniBook is tiny—11.1 by 6.4 by 1.4 inches—but it still boasts 4MB of RAM, a 130MB PCMCIA removable hard drive, and a full-size keyboard. The 9-inch, 640 by 480 VGA display isn't backlit, but it's adequate. There's also a second PCMCIA slot and an output connector for hooking up an external monitor. Running on its rechargeable nickel–metal-hydride battery pack, the subnote gives you up to four hours of mobile computing time. You transfer data to your desktop either with the built-in LapLink Remote software or with the bidirectional infrared port.

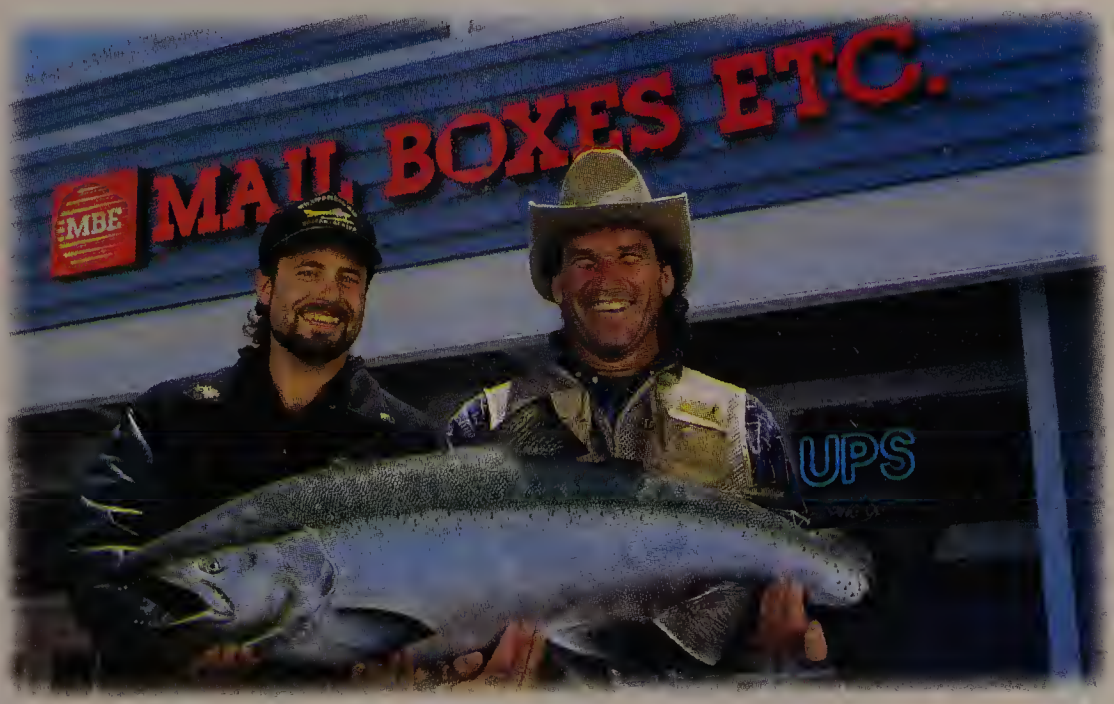
The 3-pound HP OmniBook 530 makes 486 power a breeze to carry.

The OmniBook comes bundled with Windows 3.11 and DOS 6.2. *HP OmniBook 530 PC $1799; Hewlett-Packard; 800/443-1254.* **Reader service no. 612**

For information about all products in this article, circle reader service no. 901.

BOTTOM PHOTO: ROBERT CARDIN

If catching a trophy king salmon in Alaska sounds like an adventure, try shipping it to Tulsa.



Pete Devaris of Kodiak Wilderness Tours (left) uses Mail Boxes Etc.® to take packing and shipping off his hands.

Pete Devaris, owner of Kodiak Wilderness Tours in Alaska, doesn't mince words. "We're in the adventure business, not the shipping business." So when Pete's fishing charter customers want their trophy catch sent back home, he does what other small business owners do. He heads for John Whiddon's Mail Boxes Etc.®

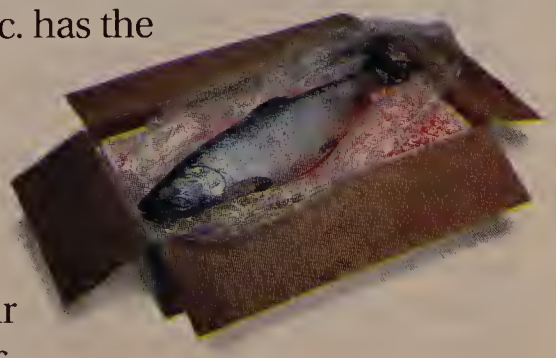
"John does it all. He has the packing material, the special boxes and the overnight UPS® service it takes to get a 60-pound salmon back to my customer's home town in perfect condition." All of which has made life a lot easier over at Pete's place.

"There was a pretty big sigh of relief back at the office when John opened his MBE Center."

In addition to expert packing, MBE provides the full range of UPS shipping services. From rapid overnight delivery to scheduled ground service to reaching destinations all over the world, Mail Boxes Etc. is your UPS connection.

We also provide full-service mailboxes, quality copies, faxes, office supplies and more.

Mail Boxes Etc. has the support services you need. And that's something you'll really appreciate as your business takes off.



MAIL BOXES ETC.®

It's not *what* we do. It's *how* we do it.™

Franchises available 1-800-456-0414

UPS Authorized Shipping Outlet. UPS and shield device are registered trademarks of United Parcel Service of America, Inc. Each MBE Center is independently owned & operated. ©1994 Mail Boxes Etc.

Circle 150 on reader service card

The ZEOS® Ambra™:
A Mean, Green, Affordable Machine.

STANDARD WITH EVERY ZEOS AMBRA SYSTEM:	PACKAGE 1	PACKAGE 2
■ Genuine Intel 486 microprocessor. ■ Intel's Pentium™ OverDrive™ upgrade socket. ■ 128K SRAM cache. ■ Two serial ports, one parallel port and one mouse port integrated. ■ Five expansion slots: two VESA local bus and three 16-bit ISA. ■ Small footprint case with four bays. ■ System speed selectable through the keyboard. ■ 200 watt power supply, switchable between 115/230V. ■ ZEOS 101-key space-saving keyboard. ■ Password feature built-in ROM for security. ■ EPA Energy Star compliant. ■ FCC Certified Class B; UL Listed. ■ Complete ZEOS Customer Satisfaction Package.	**486SX-25 ..... $1195** **486DX-33 ..... $1395** **486DX2-50 ..... $1395** **486DX2-66 ..... $1495** ■ 4MB RAM ■ 214MB IDE hard drive with built-in 32K cache ■ 3.5" 1.44MB floppy drive ■ On-board VESA local bus SVGA color video ■ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dot pitch ■ MS-DOS 6.2 w/Enhanced Tools, Windows for Workgroups 3.11, Microsoft Mouse	**486SX-25 ..... $1395** **486DX-33 ..... $1595** **486DX2-50 ..... $1595** **486DX2-66 ..... $1695** ■ 8MB RAM ■ 340MB IDE hard drive with built-in 128K cache ■ 3.5" 1.44MB floppy drive ■ On-board VESA local bus SVGA color video ■ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dot pitch ■ MS-DOS 6.2 w/Enhanced Tools, Windows for Workgroups 3.11, Microsoft Mouse **GET A DX2-50 FOR THE PRICE OF A DX-33!**

It's mean. It's green. And it's keen. But what does all this mean?

We'll tell ya'...starting with mean. ZEOS Ambra computers are not just another line of systems. The case may be slim and lean, but the system is packed with beefed-up hearty features. We give you a genuine Intel processor–from a 486SX all the way to a 486DX2 running at 50MHz or 66MHz. You also get on-board local bus video, and enough bays to add a CD-ROM, 5.25" floppy drive and tape backup. All this in our space-saving case!

It's green: All ZEOS Ambra computers are now green–meaning they use less energy. Why should you care? Because Ambra PCs cut down on pollution and lower your electricity bill. That can translate into big savings for you and your company!

These are just two of the reasons this machine is so keen. There are others like even lower prices; money-saving packages or the option to build a system to your own needs; and 100% compatibility with all major network operating systems–including Novell NetWare.

There's more...like award-winning after-the-sale support. No company has won more *PC Magazine* Readers' Choice for Service & Reliability awards than ZEOS–six in all!

The ZEOS Ambra is a little powerhouse that's great for word processing or intense spreadsheets. Whether it's plugged into your network or plugging away at the home office, ZEOS Ambra computers are the sensible system that won't cramp your style or take a bite out of your wallet. Others will be green with envy at your mean machine with the lean price. Call your ZEOS Systems Consultant now.

CALL NOW TOLL FREE

800-554-5220

ZEOS INTERNATIONAL, LTD.

Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders: Government: 800-245-2449, Outside U.S. and Canada: 612-362-1212. Purchase Orders, MasterCard, VISA, Am Ex, Discover, Z-Card,℠ COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease, 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. The Energy Star emblem does not represent EPA endorsement of any product or service. Novell compatibility is Developer Tested Only. Novell makes no warranties with respect to this product. All products and company names are trademarks or registered trademarks of their respective holders. Intel Inside is a trademark of Intel Corporation. ZEOS is a registered trademark; Ambra is a trademark of ZEOS International Ltd. ©1994 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS). AMB-PCW-9409

GLENN MITSUI

Great Communicators

The telephone is your business's lifeblood. Here's how to make the most of it. By William Rodarmor

THESE DAYS, YOU CAN HANG MORE toys on a phone line than lights on a Christmas tree. You may start with an answering machine, and later add a fax machine or fax-modem. Then your local phone company seduces you with promises of voice mail, call waiting, call forwarding, and the like. Before you know it, your office looks like an AT&T showroom, with a sprawling PBX system and wall-size video phones. Where do you stop? For that matter, where do you begin?

The key to taming the telephone is to make it work for you, not vice versa. The best way to begin is by asking a few simple questions.

What Kind of Phone?

Many small businesses start out as just that—small. Then clients start calling back, word of mouth spreads, and suddenly that princess phone in the living room has turned into a royal pain.

To keep up with the flow, you'll need to upgrade your telephone. For less than $50 you can buy a cheap phone with a "flash" key that lets you hold or transfer calls. But this is no place to scrimp. Buy a phone with every feature you think you'll ever need—then add a few to grow on.

Do family or fellow workers occasionally answer your line? Get a model with an intercom, so they can call you to the phone. Need to take orders or notes while you're gabbing? A $100 Plantronics headset lets you talk and type without getting a crick in your neck. If you and your partner absolutely must talk to a client together, get a speaker phone. A full-duplex model like the $150 AT&T Speakerphone 870 doesn't have that tinny, bottom-of-a-mine-shaft echo.

If you spend most of your time away from your desk—in a carpentry shop or back in the storage room digging through inventory, for example—consider a cordless phone. For $60 to $180 you can buy a 46- or 49-MHz model that works just fine, provided you stay reasonably close to the phone's base. Phones that use the newly approved 900-MHz frequency have greater range and clarity but cost from $299 to $450. How useful is a cordless? Ken Boche and Barrie Moss, who run Aikane Nursery on the Big Island of Hawaii, regularly take calls on an AT&T cordless while they're out tending their plants. "We couldn't live without it," says Moss.

If you're on the road a lot, a car phone lets you make deals on wheels. But be honest: Do you really need a car phone or just want company when you're stuck in traffic? Cellular gear isn't cheap—Motorola phones range from $190 to $250—and at about a dollar a minute just for local calls, the charges can quickly go through the sunroof. But for some businesses, says Salli Rasberry, coauthor of *Running a One-Person Business* (Ten Speed Press, 1994), a car phone is dynamite. Her husband, Michael Eschenbach, is a contractor in Freestone, California, who often

Be honest. Do you really need a car phone, or do you just want company when you're stuck in traffic?

has several crews working at once. Rasberry says the car phone has upped his efficiency 30 percent.

Nearly every U.S. city is served by at least two cellular phone companies, and stores that sell the gear are affiliated with a particular service, so expect a strong sales pitch. Before you buy anything, ask for a free one-month trial period to see if you get consistently good reception on the routes you usually drive. But remember, a hacker can modify a police scanner to eavesdrop on cordless or car phones. Lawyers, stockbrokers, and others who trade in confidential information should use phones wired to the wall—or be doubly discreet while talking in transit.

How Many Lines?

Many small-business owners do fine with just one phone line; others insist on two or more. Multiple lines come in handy when you share a phone line with someone else or if you need to segregate business calls for accounting purposes. But the best reason for getting additional lines is to add more gear or services—fax machine, voice mail, and so on—than one line can easily handle. No business can afford to have customers complaining that they can't get through fast enough.

So if you send or receive a lot of faxes, spend much of your day making calls, or roam online services like CompuServe, get a second line. This is especially true if you use voice

"The Vice President Is on Line Two"

After 18 years in Congress, Tom Downey was chagrined when his Long Island constituents abruptly put him out of a job two years ago. Today, the former representative heads a five-person legislative consulting firm half a mile from the Capitol dome. Downey does some lobbying, but he primarily tracks issues and offers strategic advice. He knows people like Treasury Secretary Lloyd Bentsen and White House Chief of Staff Leon Panetta—and he happens to be best friends with Vice President Al Gore. So when people want to reach out to the powerful, they reach out to Downey.

Window of opportunity: Former U.S. Rep. Tom Downey and partner Kathleen McLaughlin work the phones.

"The time Tom spends on the phone!" exclaims Kathleen McLaughlin, Downey's partner and former chief of staff. On a moderately busy day, she says, the office gets more than 200 calls—or about 1 a minute. As a result, Downey and Associates has had to develop some unique phone survival skills.

When Downey and McLaughlin first set up shop, each had a phone line that could "ring over" to a second number—the equivalent of four phone lines. "When we expanded to four people, we set up one main line and five ring-overs," says McLaughlin. "So now we have six lines, but only four people! We're always getting two calls at once." The firm made another unusual choice: "We had the privacy feature overridden," says McLaughlin. "That way, we can pick up on a live line, and have two, three, or even all four of us on the same call."

In addition to a hard-working fax machine, the firm uses voice mail, but with a twist. Callers can leave messages for McLaughlin or her two colleagues—but not for Downey. "Otherwise everybody would call for Tom," she says, "and I'd have to retrieve the messages anyway." McLaughlin also uses her phone's "conference" feature to put people through to Downey when he's out. "Tom can take the call at home, and the caller doesn't know that he isn't sitting right in the office."

Downey also likes an absurdly low-tech architectural feature: a sliding window between his and McLaughlin's offices. "We leave it open," she says. "I can listen when Tom is talking, take notes, and follow up." More than once, calls for Downey have come in on McLaughlin's private line, and she's had to hand the phone through the window to her boss. "Then of course his phone will ring, I reach over to pick it up, and we get tangled in the lines."

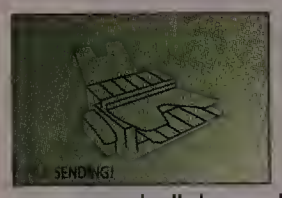
Even when they're tied up, though, staffers know which client takes precedence. "If [White House Adviser] George Stephanopoulos calls, we drop everything," says McLaughlin. "And if the vice president rings, we stop what we're doing and get Tom to the phone."

KATHERINE LAMBERT

THE NEW WIZARD OZ-9520FX.

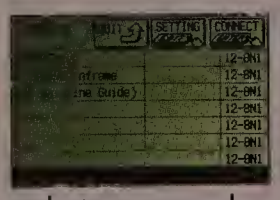
(IT WOULD BE EASIER TO TELL YOU WHAT IT DOESN'T DO)

It's the latest addition to the #1 selling line of personal information organizers. It features a pen-based graphical user interface, 512K of



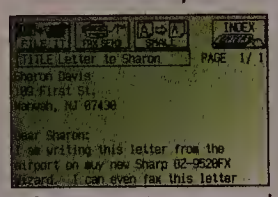
memory and all the tools you could ever want in a 10.5 ounce package. And the new "ultra-compact fax modem" only adds 1.27 ounces and requires no additional cables or setup for use. Best of all, it can remain attached to the Wizard and still fit in a pocket or purse.

The unit's built-in fax software permits users to send a drawing, a letter, or even an entire folder of documents. The software also provides a speed-dial directory and automatically creates a cover sheet for outgoing faxes. By entering the terminal mode the OZ-9520FX uses ASCII or VT-100

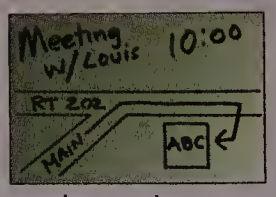


emulation to send and receive electronic mail and connect to on-line services like CompuServe®.

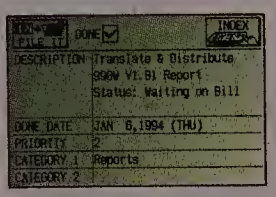
A word processor with cut, paste, and a variety of text styles enables you to produce professional-looking letters. Completed documents can then be beamed to a colleague's Wizard or output wirelessly to a PC-compatible printer with the optional infrared adapter.



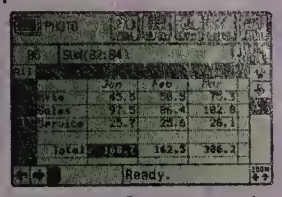
Scrapbook allows you to draw and store hand-written words or maps and diagrams directly on the screen using the Wizard's stylus or your finger. Images can also be imported from a PC or Mac® into Scrapbook enabling telephone entries, for example, to have portraits or maps attached to them. A unique Filer system–of graphically represented folders–groups related information together by subject, making it ideal for project management.



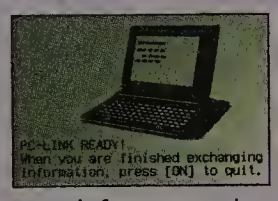
And when it comes to time management, Wizard sets the standard. Four different calendar views, 3 phone directories, a To Do list, and there's even a function that allows you to enter annual events, like birthdays and anniversaries, so you'll never miss a moment.



The Wizard is your virtual office. No matter where the day takes you, creating a spreadsheet is as easy as inserting the optional PenCell® spreadsheet card.



Using Computer Link software, data can be transferred to and from a PC or Mac.® And the optional wireless adapter enables Wizard's infrared technology to make this transfer effortless.



And if you ever have any questions there's even a built-in tutorial with explanations and diagrams for every function. But, until you get one, fax us at 1-800-74-SHARP. We'll answer your questions about the OZ-9520FX and tell you about our high-end OZ-9500 and OZ-9600II series. Or call us at 1-800-BE-SHARP and we'll help locate your nearest dealer. It's just about the only thing this Wizard can't do for you.

THE NEW WORKPLACE™

WIZARD® Carried By The Most Organized People On Earth.

SHARP®
FROM SHARP MINDS COME SHARP PRODUCTS™

LCD

COPIERS • FACSIMILE • LASER PRINTERS • NOTEBOOK COMPUTERS • COLOR SCANNERS • PERSONAL DIGITAL ASSISTANTS • CALCULATORS
CORDLESS TELEPHONES • TYPEWRITERS • WORD PROCESSORS • WIZARD® ORGANIZERS

©1994 Sharp Electronics Corporation. Simulated Screen Image.

Circle 144 on reader service card

mail—most voice messaging services can't properly identify incoming fax calls and will fill up your mailbox with fax machine beeps.

And if your office has six or more employees, consider getting an integrated office phone system, or PBX (Private Branch Exchange). A PBX lets you smoothly integrate phone, fax, and modem lines, and tailor each station with features like speed-dialing, paging, voice mail, a speakerphone, and more. Mainly, a PBX is the best way to control mounting phone bills, letting you track who calls where and for how long. Many firms, including phone companies, sell PBX systems. Hello Direct of San Jose, California, for example, carries Executone systems that range from a 4-line, 8-station system for $1799 to an 8-line, 16-station system for $3669, including installation and training.

What's Your Line?

Should you get a business or residential listing? Is an 800 number worth the extra cost? Which long-distance carrier should you choose? So many questions, so little time to worry about them. Here's a brief guide.

The best reason to pay for a business line is to get a separate business or Yellow Pages listing. Businesses from pizza makers to car mechanics live or die in those pages. But if you get most of your clients by word of mouth, you'll do better with a residential line. You pay more for a business line in installation and monthly fees, and you're usually charged for every local call you make. If you decide to get a business listing, follow the advice of P.A.M. Borys, a computer consultant in Woburn, Massachusetts, and use the line strictly for incoming calls; make all your outgoing calls on your residential line.

A word of warning: If the phone company knows you're running a home business, it may insist you pay business rates. A few years back, a Texas phone company decided that all computer bulletin board services were home businesses and charged them accordingly. But other home businesses have gone undetected for years—including one BBS operator who had nearly a hundred residential lines to his house, to the amusement of the local phone installers.

A different listing decision arose for Kerry Myers, who designs desk nameplates in San Francisco. He lists his business in the 27-volume *Thomas Register of American Manufacturers* but recently decided to get an 800 number, which AT&T links to a national business-to-business directory. The 800 service piggy-

No Place Like Home

What's the difference between business and residential phone service charges? As much as several hundred dollars a year, in some cases. Here's a quick look at key services available for homes and businesses in Phoenix, Boston, San Francisco, and Washington, D.C.

BUSINESS VERSUS RESIDENTIAL PHONE SERVICE RATES

	PHOENIX U.S. WEST		BOSTON NYNEX		SAN FRANCISCO PACIFIC BELL		WASHINGTON, D.C. BELL ATLANTIC	
	Business	Residential	Business	Residential	Business	Residential	Business	Residential
INSTALLATION								
Connect fee [1]	$56.00	$46.50	$93.02	$37.07	$70.75	$34.75	$83.25	$20.76
Call waiting [2]	$13.00	$13.00	n/c	n/c	$6.00	$5.00	n/c	n/c
Voice mail [2]	$15.00	$13.00	n/c	n/c	$15.00	$15.00	$15.00	$10.00
One-time subtotal:	**$84.00**	**$72.50**	**$93.02**	**$37.07**	**$91.75**	**$54.75**	**$98.25**	**$40.76**
MONTHLY COST								
Local access [3]	$32.00	$12.40	$17.97	$21.33	$11.85	$11.85	$14.24	$15.30
100 local calls	n/c	n/c	$7.80	n/c	$6.00	n/c	$7.25	n/c
Call waiting	$7.50	$5.00	$5.10	$2.58	$4.20	$3.50	$5.30	$4.75
Voice mail	$12.75	$6.95	$12.00	$6.00	$19.95	$5.95	$10.00	$10.00
6 additional boxes	$76.50	n/a	n/a	$6.45	$119.70	$17.70	n/c	n/c
Monthly subtotal:	**$128.75**	**$24.35**	**$42.87**	**$36.36**	**$161.70**	**$39.00**	**$36.79**	**$30.05**
Grand total:	**$212.75**	**$96.85**	**$135.89**	**$73.43**	**$253.45**	**$93.75**	**$135.04**	**$70.81**

n/a = not available n/c = no charge

[1] Deposits often required on business lines. [2] Extra charge if added after initial line installation. [3] Includes variable federal access charge.

Introducing a great value notebook that just gets better.

Connect your CD-ROM drive or nearly any other peripheral through the standard SCSI II port—a powerful first for such an affordable notebook.

Multimedia is here and now. An optional 16-bit stereo sound card, microphone, and speakers let you add show to your business.

The optional Port Replicator provides one-step connection to monitor, keyboard, mouse, audio, and printers. One port for SCSI II and another for either MIDI sound or a joystick.

Connect your joystick via the optional Port Replicator. Soar through presentations, handle educational programs, even enjoy games.

Two separate PCMCIA slots for industry-standard expansion cards make room for on-the-road data/fax modems, networking adapters, hard drives, and many more options.

The New Satellite T2400C Series expands our affordable Satellite family with innovative new features. You'll appreciate the visual impact of our brilliant SVGA displays. Harness the power and capacity of a 50MHz i486™ processor and generous hard drive. Enjoy advanced ergonomics like the rugged casing and new AccuPoint™ integrated pointing device. And with loads of options, the T2400C Series really grows on you. **Call 1-800-457-7777 for your nearest dealer.**

MICROSOFT® WINDOWS™ READY-TO-RUN

intel inside

Satellite™

$3199*

T2400CS
- 9.5" dia. color Dynamic-STN dual-scan display
- 250MB HDD
- 4MB RAM expandable to 20MB

T2400CT
- 8.4" dia. color TFT-LCD active matrix display
- 250/320MB HDD
- 8MB RAM expandable to 24MB

BOTH MODELS
- i468DX2/50MHz, 3.3v
- Integrated math co-processor
- 8KB of cache
- Two PCMCIA slots (14.5mm & 5mm)
- AccuPoint™ integrated pointing device
- VL local-bus video
- SCSI II Port
- External SVGA monitor port
- Optional 16-bit stereo sound card-Sound Blaster™ Pro SW compatible
- Optional Port Replicator
- 6.5 lbs.
- NiMH battery with Toshiba MaxTime™ Power Management
- 3.5" 1.44MB floppy disk drive
- Pre-installed software: MS-DOS®, Microsoft Windows™ for Workgroups

In Touch with Tomorrow

TOSHIBA

©1994 Toshiba America Information Systems, Inc. The Intel Inside logo is a trademark of Intel Corporation. All products indicated by trademark symbols are trademarked and/or registered by their respective companies. ★T2400CS, 250MB HDD. Reseller prices may differ. All prices and specifications are subject to change. Shipping, handling, and applicable sales tax not included.

Circle 228 on reader service card

backs on his existing line, and after a $50 connect fee, Pacific Bell charges him $15 a month plus a usage fee of $6 to $10 an hour. "Advertising in the 800 book is cheaper than the *Thomas Register*," says Myers. "I hope to get more bang for my buck."

Long-distance service involves too many variables to list here. But remember: AT&T, Sprint, and MCI are clawing at each other to get your business—so now is an excellent time to negotiate. Even if you've been using Sprint since before Candice Bergen became Murphy Brown, call up and point out that MCI has been courting you. They just might make you an offer you can't refuse.

Answering Machine or Voice Mail?

For years, answering machines have been around to answer calls when you're not. Today, you can also use voice-mail services that are as impressive (or maddening) as those used by the Fortune 500. Which should you choose? Well, maybe both.

Answering machines provide many of the features of voice mail for less money, and they're surprisingly sophisticated. For example, Southwestern Bell's Digital Answering Machine comes with four voice mailboxes for $119—about what three to six months of voice mail would cost. For $129 without a built-in phone (or $169 with), the AT&T two-line Remote Answering Machine takes calls on both lines and gives four different outgoing messages. And you can use a machine to screen calls—vital if you want to work while listening for that critical long-distance call.

But voice mail has one big advantage: It takes messages even when you're on the phone, so your callers never hear a busy signal. Voice mail can also make your business sound bigger than it is and handle customers efficiently. You can set up extension mailboxes (with individual passwords) so callers can leave private messages for the person best able to handle them ("For velociraptor breeding information, press 1; to charge by phone, press 2."). You can even set up guest mailboxes for temporary workers or forward messages from one mailbox to another.

When it comes to voice mail, Michael Phillips, a small-business consultant and radio talk show host in San Francisco, is a true believer. "A major function of voice mail is to reduce the amount of time you spend fielding calls you don't have to," Phillips says. "You shouldn't find yourself repeating, 'We're open 9 to 5 and until 8 p.m. on Thursday', or, 'Yes, we accept credit cards'."

But voice mail can be expensive, especially if your local phone company charges full price for each extension mailbox. And some people just don't like it. So be sure to record a friendly, informative greeting, and tell callers early on that they can press the * or # key to bypass your outgoing message—a boon to long-distance callers.

In short, if you need to save money or screen calls, get a machine. When you want to sound big—or can't afford to miss any calls—go for voice mail. If money is no object, get both.

Reach Out and Touch

Whatever strategies you ultimately choose, the bottom line is that businesses flourish when they treat their customers well. Using the phone intelligently helps, but all the technology in the world can't replace face-to-face contact. So after you've modemed that final spec sheet, faxed the last architectural sketch, and turned on voice mail to greet the rest of the world, go have a cup of coffee with a client. Because when it comes to conveying information about your business and yourself, no device is as powerful as the human face.

A former **PC World** editor, William Rodarmor is managing editor for **California Monthly,** the alumni magazine for the University of California, Berkeley.

GLENN MITSUI

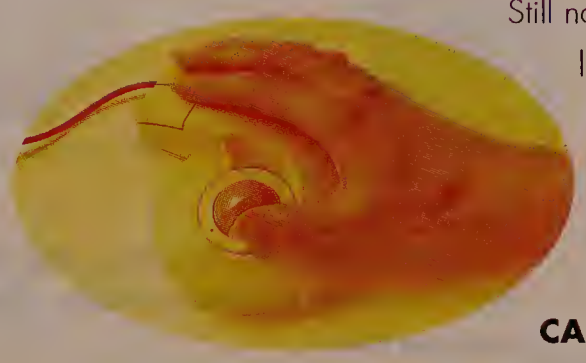
Answering Machine in Your PC

Answering machines are inexpensive, and voice mail is flexible. But if you own a PC, you can get the best of both worlds with a voice-enabled modem, which lets you create your own voice-mail system. Available as an external model or a card that slips into your PC or Macintosh, this device stores messages on your hard disk and allows callers to select standard voice-mail options. So what should you look for in one of these units? The same things you'd look for in a regular fax-modem: 14.4-kilobits-per-second speeds for faxes and data, V.42bis and MNP-5 data compression, and V.42 error correction. Then be sure that it works as an answering machine: It should support remote access (so you can dial in and collect messages) and switch automatically among voice, fax, and data modes as incoming calls demand. The prices for these modems range from $99 to $799; most are less than $250. At press time, vendors included: Best Data Products (800/632-2378), Boca Research (407/997-6227), Computer Peripherals (800/854-7600), Digicom (800/833-8900), E-Tech Research (800/328-5538), Interactive (800/292-2112), Media Magic (800/624-8654), MultiTech Systems (800/328-9717), National Semiconductor (800/538-8510), Octus (800/634-8248), Prometheus Products (800/477-3473), Spectrum Signal Processing (800/667-0018), Zoltrix (510/657-1188), and Zoom Telephonics (800/666-6191).

WE DIDN'T BECOME THE WORLD'S BEST SELLING TRACKBALL ON GOOD LOOKS ALONE.

TRACKMAN®. A UNIQUE COMBINATION OF BEAUTY AND BRAINS.

In independent testing, TrackMan's three assignable buttons and enhanced MouseWare® software cut nearly 50% off the time it takes to execute routine commands.



SEE FOR YOURSELF.

Still not sure TrackMan's for you? Visit your local retailer and take it for a test drive. If you're not completely satisfied, return it any time during the next sixty days for a complete refund. No questions asked.

CALL 1-800-889-0069 for more information.

BEST BUY

Fry's ELECTRONICS

inmac
1-800-547-5444

™/® Trademarks are the property of their respective owners.

LOGITECH
The Senseware™ Company

Circle 241 on reader service card

EASY DOES IT.

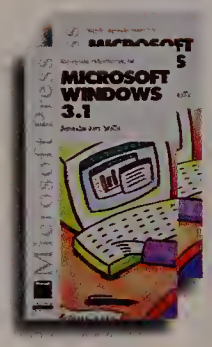
$39.95

Any single video tape listed below. Reg $49.95
Or buy any two–tape set for just $69.95

Windows 3.1

Windows 3.1, Introductory Skills
Windows 3.1, Intermediate/ Advanced Skills
Each $39.95

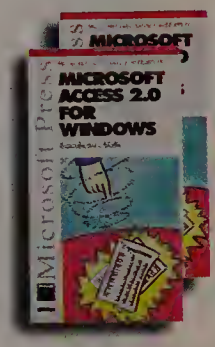
Two–Tope Special $69.95



Access 2.0

Access 2.0 for Windows, Introductory Skills
Access 2.0 for Windows, Intermediate/Advanced Skills
Each $39.95

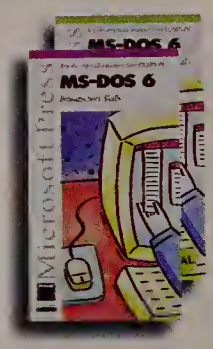
Two–Tope Speciol $69.95



DOS 6.0

DOS 6.0, Introductory Skills
DOS 6.0, Intermediate/ Advanced Skills
Each $39.95

Two–Tope Speciol $69.95



Getting Acquainted with Your Computer

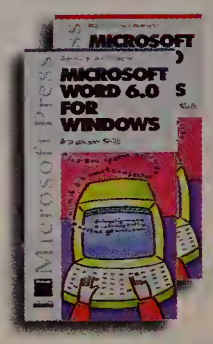
Getting Acquainted , Introduction
Getting Acquainted , Hardware and Software Basics
Each $39.95

Two–Tape Speciol $69.95

Word 6.0

Word 6.0 for Windows, Introductory Skills
Word 6.0 for Windows, Intermediate/Advanced
Each $39.95

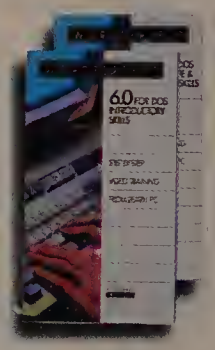
Two–Tope Special $69.95
Also availoble Word 2.0 for Windows



WordPerfect 6.0 DOS

WP 6.0 for DOS, Introduction
WP 6.0 for DOS, Intermediate/ Advanced
Each $39.95

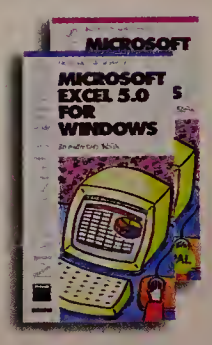
Two–Tope Speciol $69.95
Also ovoilable WP 5.1 for DOS



Excel 5.0

Excel 5.0 for Windows, Introductory Skills
Excel 5.0 for Windows, Intermediate/Advanced Skills
Each $39.95

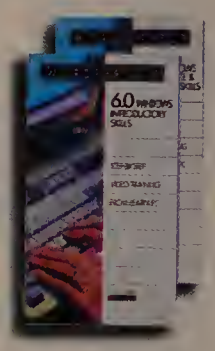
Two–Tope Special $69.95
Also available Excel 4.0 for Windows



WordPerfect 6.0 for Windows

WP 6.0 for Windows, Introduction
WP 6.0 for Windows, Intermediate/ Advanced
Each $39.95

Two–Tope Speciol $69.95
Also ovoiloble WP 5.1 for Windows



Microsoft PRESS®

—"LEARN PC videos are the best I've ever seen. They're clear, concise, and easy to follow. I highly recommend them."

Elton Welke
Publisher
Microsoft Press

LOTUS PUBLISHING

Microsoft is registerded trademark of Microsoft Corporation. Lotus is a registerded trademark of Lotus Development Corporation.

LEARN ALL YOUR SOFTWARE THE EASY, VIDEO WAY.

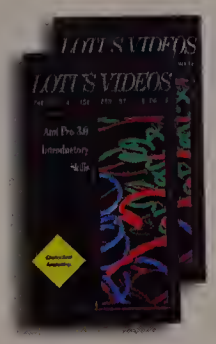
Why trust our videos? We're the only company selected to produce video training for Lotus Publishing Corporation, Microsoft Press and Software Publishing.

The approved video training developer for Lotus Publishing and Microsoft Press.

Ami Pro 3.0

Ami Pro 3.0, Introductory Skills
Ami Pro 3.0, Intermediate/ Advanced Skills
Each $39.95

Two–Tape Special $69.95



1-2-3 Release 4 for Windows

1-2-3 Release 4 for Windows, Introductory Skills
1-2-3 Release 4 for Windows, Intermediate/Advanced Skills
Each $39.95

Two–Tape Special $69.95

Freelance Graphics 2.0 for Windows

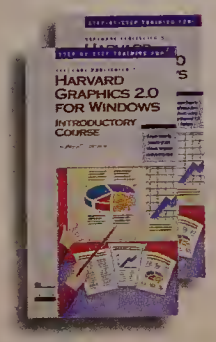
Freelance Graphics 2.0 for Windows, Introductory Skills
Each $39.95

Two–Tape Special $69.95

Harvard Graphics

Harvard Graphics, Introduction
Harvard Graphics, Intermediate/Advanced Skills
Each $39.95

Two–Tape Special $69.95



—"These videos flat out work. That's why they carry our name."

Craig Pierce
Publisher
Lotus Publishing Carparation

SuperSavings Lotus® Special

Five Videos $169.95 ~~$249.75~~

Ami Pro 3.0, Introductory Skills
Ami Pro 3.0, Intermediate/Advanced Skills

1-2-3 Release 4 for Windows, Introductory Skills
1-2-3 Release 4 for Windows, Intermediate/Advanced Skills

Freelance Graphics 2.0 for Windows, Introductory Skills

SuperSavings Microsoft® Special

Six Videos $219.95 ~~$299.70~~

Word 6.0 for Windows, Introductory Skills
Word 6.0 for Windows, Intermediate/Advanced

Excel 5.0 for Windows, Introductory Skills
Excel 5.0 for Windows, Intermediate/Advanced Skills

Access 2.0 for Windows, Introductory Skills
Access 2.0 for Windows, Intermediate/Advanced Skills

SuperSavings Mix and Match

Any Four Videos $125.95 ~~$199.80~~

Two Easy Ways to Order

Call 1–800–824–5520. *Your call is toll free. Many other titles available. Ask for details. We accept Visa, MC or Amex.*

Fax 1–301–843–6475: *Fax your authorized purchase directly to our order desk. Or mail your order to LEARN PC, PO Box 753, Waldorf, MD 20604.*

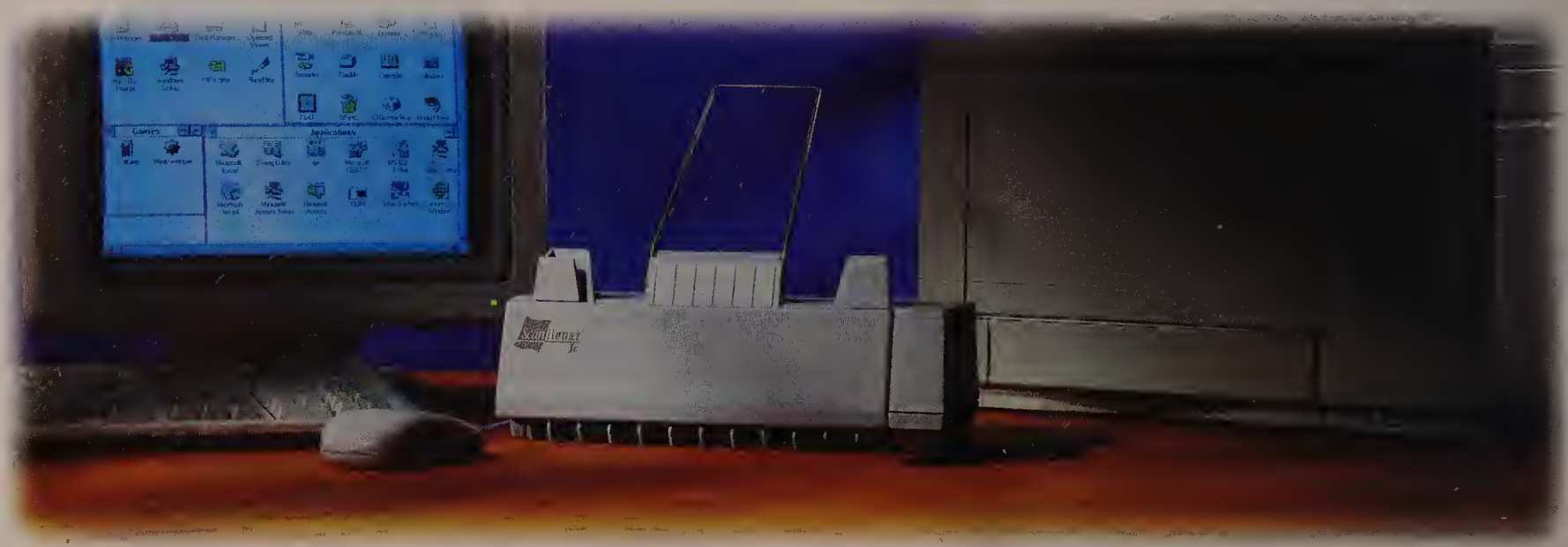
When ordering please include: Item number, video title(s), and quantities, as well as shipping/billing address and phone number. Please include applicable sales tax. Shipping and handling extra. For internatianal call for details.

LEARN PC®
The Power to Perform

FV94

Circle 246 on reader service card

Now You Can Put **Document Imaging** Where It Can Do The **Most Good.**



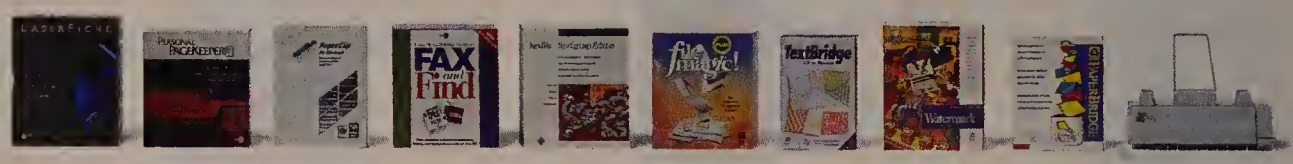
Introducing the ScanPartner™ Jr.

At last! Fujitsu's new ScanPartner Jr. Now you can image enable every PC and put document imaging right where it'll do the most good...on everyone's desk.

ScanPartner Jr. maximizes personal productivity by electronically linking PCs to the world of paper. It's a six-page-per-minute, 300 dpi, 256-level gray scale document image scanner that's small enough to fit easily on any desktop. And when combined with the leading document imaging, OCR and general office software applications, ScanPartner Jr. makes it possible for anyone to scan, file, retrieve, edit, annotate, fax, route, e-mail and share paper-based information. All with the click of a mouse and the convenience of staying right at their desk. What's more, with a suggested retail price of $599, it's so affordable everyone can have their own.

With ScanPartner Jr. you'll start getting the most out of your desktop computers, applications and peripherals right away. Because every ScanPartner Jr. includes ScandAll™ image capture software for Windows™ with the capability to turn a PC into an electronic filing cabinet. Image enable a fax/modem. And turn a laser printer into a personal copier.

You'll also feel confident knowing that ScanPartner Jr. is supported by the industry's top ISIS- and TWAIN-compatible software applications. And with ScanPartner Jr.'s unique replacement warranty, if anything goes wrong in the first year, you'll get a new one within 48 hours.



ScanPartner Jr. already has the full support of document imaging industry software leaders such as Compulink, Caere, PaperClip Imaging, Keyfile, Westbrook, Xerox Imaging Systems, Watermark and TEAMWorks Technologies.

So call Fujitsu today. Then make ScanPartner Jr. the standard for every desktop. After all, isn't that where document imaging was meant to be?

1-800-831-4094

FUJITSU

Limited-Time Offer:
Free TextBridge™ OCR Software From Xerox Imaging Systems! (If purchased before September 30, 1994.)

COMPUTERS, COMMUNICATIONS, MICROELECTRONICS

©1994, Fujitsu. ScanPartner and ScandAll are trademarks of Fujitsu Computer Products of America, Inc. All brand names and product names are trademarks or registered trademarks of their respective holders.

Circle 153 on reader service card

How To Open Up Windows All The Way.

Sure, Microsoft® Windows™ gives your organization a boost in productivity right out of the box.

But people tend to learn just enough to run Windows on a basic level. And while they know enough to get by, they may never break through to the next level of power that can make a major difference in productivity.

Independent studies of ExecuTrain clients show one day of training can improve productivity 30%.

So if you're just getting into Windows, or want more return from your existing Windows investment, talk to ExecuTrain. We now offer more than 60 Windows courses, from *Overview of PCs for Windows* to *Advanced Microsoft Project for Windows*. And each one is designed to unlock the powerful Windows features that are often missed with a learn-as-you-work approach.

For example, new Windows application suites make it essential to understand multi-tasking features like multiple document interface (MDI) and object linking and embedding (OLE) that save time and free your people to be more effective and professional in their work.

All it takes is one day of ExecuTrain training to break through to new levels of productivity. To find out how we can help you open up Windows all the way, call ExecuTrain today.

ExecuTrain®
The Computer Training Leader

1-800-535-9479

© 1994 ExecuTrain Corporation. All Rights Reserved. ExecuTrain and the ExecuTrain logo are registered trademarks of ExecuTrain Corporation.

Circle 82 on reader service card

Here's How

Contents: Spreadsheets 258 | Word Processing 262 | Windows 266

HELP LINE Q&A

Tip of the Month

BALANCING DISK COMPRESSION AND DATA SAFETY: Are you wary of disk compression? Put your programs on the compressed drive, and your data files on a separate, uncompressed drive. Not only will your data will be safe if the compression program crashes, you only have to select one drive to back up all your data.

If you're a new user ready to set up an empty hard disk, install DOS and partition your hard disk, giving one third to drive C: and two thirds to drive D:. Format each drive, making C: the boot drive, and then install your compression package on C: and compress only that drive. If you're using Windows, install it next and create a permanent swap file on drive D:. Next, install your programs, instructing them to create their working directories on D:. Last, create a boot floppy containing such files as CONFIG.SYS, AUTOEXEC.BAT, FORMAT.COM, and FDISK.EXE so in the event of a crash you'll be able to access your data drive and begin recovery.

Hardy souls wanting to reconfigure their hard disk in this manner should back up programs and data files, create a boot floppy as described above (or use DOS setup disks), and use FDISK to remove existing partitions and create new ones.

Richard Koroll, Etobicoke, Ontario, Canada

Parlez-Vous OS/2?

Q How does OS/2 compare to DOS? I've heard it's faster than DOS and uses less memory—is this true? Do I have to buy all new software, or will my DOS and Windows software work? If I decide to use OS/2, how should I go about installing it and removing DOS?

Kevin A. Normand, Lafayette, Louisiana

A OS/2, unlike DOS, is a complete 32-bit multitasking operating system. It is sometimes faster and sometimes slower than DOS, depending on what software you are running and how that software uses system resources. (File access, for instance, tends to be quicker, so disk-intensive programs may run faster.) It does not, however, require less memory than DOS. Like Windows, it needs at least 8MB to run well, and 16MB is preferable.

OS/2 runs almost all DOS and Windows software. If you don't want to run Windows software under OS/2, or if you want OS/2 to use your existing copy of Windows, you can save money by buying the less expensive OS/2 for Windows instead of the regular OS/2 package. (Regular OS/2 includes code to run Windows programs; OS/2 for Windows does not.)

You don't need to uninstall DOS. OS/2's installation process lets you replace DOS with OS/2 or, if you prefer, gives you a "dual boot" option that lets you pick which one to run when you start your PC. The latter is handy as a backup, in case you need to run software that works only under DOS.

Lotus Limps

Q When I run 1-2-3 release 2.2 from Windows, the program opens and I can issue commands from the 1-2-3 menu. But when I try to retrieve a spreadsheet, I get a message from Windows saying that 1-2-3 has attempted to execute an invalid instruction and has violated system integrity. I have reviewed the PIF file for 1-2-3 (which was provided by Microsoft) and found nothing unusual about it. My system uses MS-DOS 5.0, 386Max 7.0, and a Diamond graphics card. Can you help me get 1-2-3 to run?

James P150, America Online

A There are several possible problems. 1-2-3 release 2.2 uses a DOS extender—special built-in software that lets the program run in protected mode and gives it more than 640K of memory to work with. Windows sometimes fails to cooperate with DOS programs—especially those built with DOS extenders. You may be able to mitigate this problem by adding the line **MaxBPs=768** to the [386Enh] section of SYSTEM.INI.

Another possible source of the problem is the video display driver. Windows sometimes has problems with DOS programs that are attempting to take advantage of a video card's advanced features and high-resolution graphics modes. Try using the simplest Lotus text driver—the 80 by 25 driver for a standard VGA. If you use 1-2-3's graphics functions, use the standard VGA driver for these also; otherwise, select no graphics driver at all. You may not be able to see as many rows or columns of information in standard VGA (640 by 480) as in a higher resolution, but this is often the only way to reduce the incidence of crashes in Windows DOS boxes.

Y Not?

Q At the end of each year, I run a batch program that backs up my files to tape and uses DEL *path**.* to delete all the previous year's files. Trouble is, the batch file pauses for confirmation before deleting the files. Is there any way to eliminate the prompt?
J. P. Rabbitt, Fayetteville, Georgia

A In DOS 6.0 and above, you can use the command DELTREE with its /Y option to delete a directory tree with no confirmation. Thus, the command DELTREE *path* /Y does the trick, though you have to re-create the directory afterward.

Two Smart

Q What is the difference between SMARTDRV.EXE and SMARTDRV.SYS? On my PC, a DEVICE= line in CONFIG.SYS loads SMARTDRV.SYS, while another line in AUTOEXEC.BAT loads SMARTDRV.EXE. Do I need them both?
Steven Gorman, San Francisco

A The very first versions of the SmartDrive disk cache were implemented as CONFIG.SYS device drivers called SMARTDRV.SYS. But in Windows 3.1 and DOS 6, SMARTDRV.EXE, a double-duty program, replaced SMARTDRV.SYS. When loaded with a DEVICE= statement in CONFIG.SYS, SMARTDRV.EXE becomes a device driver that can provide double buffering for certain hard-disk controllers that cannot work with the memory provided by EMM386 or Windows running in 386-enhanced mode. But when you load SMARTDRV.EXE from AUTOEXEC.BAT, it sets up read/write caching for your floppy, hard, and CD ROM drives. You can also use it in any batch file or at the DOS prompt to turn off or change caching functions and to report whether buffering is needed.

If you have SMARTDRV.EXE (I recommend the version that came with DOS 6.2 and 6.21) and want to keep using SmartDrive as your disk cache, delete SMARTDRV.SYS from your hard disk and use SMARTDRV.EXE instead. Don't use SMARTDRV.EXE as a driver in your CONFIG.SYS file unless your disk system requires double buffering.

Funny File

Q I've found a file called 386SPART-.PAR on my hard drive. It's a hidden system file more than 12MB in size. What is it? What's it for?
Jon n Fla, America Online

A 386SPART.PAR is the name of Windows' permanent swap file. A swap file is a file on your hard disk in which Windows stores information that overflows your computer's RAM. Because Windows programs see this part of your disk as RAM, it's called virtual memory. It's important not to try to move, write to, or delete this file—especially while you're running Windows—or Windows may get confused or crash.

If you don't want a permanent swap file to take up 12MB of valuable disk space, you can change its size. Open the Windows *Control Panel*, double-click the *386 Enhanced* icon, click the *Virtual Memory* button, then the *Change* button, and pick which drive to use, the type of swap file (permanent or temporary), and its size in K.

A temporary swap file, unlike a permanent one, is deleted when you quit Windows. If you use one, your applications may run slightly slower. A temporary swap file is not necessarily contiguous (which means it may take longer to read), and Windows can't bypass DOS when accessing it (as Windows can with a permanent one). However, a temporary swap file has one big advantage: It can shrink or grow (up to a maximum size you set), while a permanent swap file is always a fixed size. The Virtual Memory dialog box also gives you the option of running with no swap file at all. But since Windows programs tend to be memory hogs, it's best to avoid this; it'll make your system very slow and may cause programs to crash.

USER GROUP OF THE MONTH

Channel Islands PC Users Group

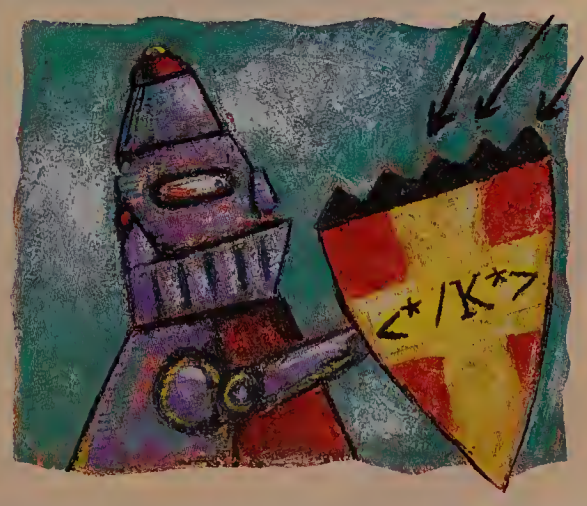
The Channel Islands PC Users Group meets the first Saturday of the month in the Camarillo Airport Freedom Center in Camarillo, California. Visitors may attend at no charge, and novice users are welcome. CIPCUG has special interest groups in such areas as Windows, OS/2, modem use, and what's inside your PC. It also offers free two-to-six-week training sessions for various programs and participates in the computer shows held in Ventura and Oxnard. Members receive *The Outer Edge*, a monthly 12-page newsletter that features software and book reviews, tips, a help section, and classified ads. A no-fee 14.4-kbps BBS, called Y-Not, is available to members and the general public.

For more information contact Bob de Violini, P.O. Box 5025, Oxnard, CA 93031, or call 805/983-4741. You can access the BBS at 805/484-9625. Individual membership is $30 per year and renewals are $20.

Reader service no. 601

A SHIELD FOR MY AUTOEXEC.BAT: I prevent programs from changing my AUTOEXEC.BAT file without permission by renaming the file to AUTO.BAT and adding /K to the end of the SHELL command in CONFIG.SYS. For example, the line SHELL=C:\DOS\COMMAND.COM /K=C:\AUTO.BAT tells DOS to read AUTO.BAT instead of AUTOEXEC.BAT. If you want to let a program change your AUTOEXEC.BAT, you'll have to change AUTO.BAT's name back to AUTOEXEC.BAT and then back again afterward.

Bob de Violini
Channel Islands PC Users Group



Irretrievably Stacked?

Q I am using Stacker 3.1 with MS-DOS 6.2. Now that I have added another hard drive, I want to unstack my disk. However, there are lost clusters on my C: drive (a Stacker drive), and Stacker says I must run CHKDSK before unstacking. CHKDSK doesn't solve the problem, and prints a message telling me to run ScanDisk, which in turn says it will not correct errors while Stacker is running. What do I do?
Christopher J. McCarthy, San Antonio

A Lost clusters—clusters allocated for use but not linked to a specific file—are a common occurrence, especially if you run Windows and your system locks up or crashes before you exit. Stacker is correct: To remove the lost clusters you must run CHKDSK. But you must invoke CHKDSK with the /F command line parameter. If you don't, CHKDSK examines the disk but does not fix any problems it finds.

CHKDSK's message advises you to run ScanDisk instead, because ScanDisk can find and fix more kinds of disk problems. However, CHKDSK is still the simplest and the best way to get rid of lost clusters.

Talking Modem

Q I often access the computers in our home office from our satellite office using Close-Up, a remote control program. While I'm doing that, I'd like to be able to speak to someone at the other machine over the same phone line so I can describe what I am doing. Is there a software package that will allow a person to transmit data and voice at the same time via modem?
IMJFK, America Online

A There's no software package that does what you ask, but a hardware product may fit the bill. MultiTech Systems makes a modem called the MultiModemPCS, which has a handset attached to the side. After two of these modems establish a data connection, you can initiate a voice conversation over the same line by simply picking up the handset at one end. The other modem rings, and a voice connection is established when the second handset is picked up. Because the bandwidth for the voice transmission is "stolen" from the data connection, data transmission does slow down a bit, but it's still reasonably fast.

You must have these special modems at both ends of the connection to use the voice-over-data feature. However, you can use a MultiModem PCS for a data-only connection to any standard modem at up to 14.4 kbps.

- **MultiModem PCS;** MultiTech Systems; 800/328-9717
  Reader service no. 676

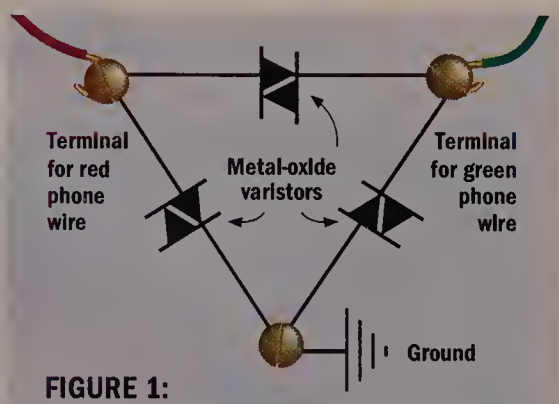


FIGURE 1:
CONNECT THREE MOVS in a triangle across your phone line and its ground line to protect against transverse and common mode surges.

Have Another SIP

Q I have heard of an adapter that enables SIP memory modules [the ones with the pins that stick out of the bottom] to sit in SIMM sockets. I have contacted a few mail-order companies, which say they've been asked before about these adapters but have not seen them. Do you know where I can purchase one?
Leo Osborn, Evanston, Wyoming

A JDR Microdevices carries a SIP-to-SIMM adapter. Many older SIPs are, however, too slow for today's PCs, so make sure the access times on the SIPs are fast enough for your machine. SIP-to-SIMM adapters work best on PCs designed to take three-chip SIMMs. These systems refresh DRAM more frequently, so are more likely to work with SIPs (or any other DRAMs) that are picky about refresh times.

- **JDR Microdevices;** 800/538-5000.
  Reader service no. 677

MOVing Right Along

Q In the March *Tip of the Month*, you stated that a metal-oxide varistor (MOV) would protect a phone line from power surges. Please explain whether I should install the MOV in parallel (between two of the wires) or in series (by cutting a wire and inserting the MOV).
Walt H. Wolf, La Quinta, California

A Several readers have asked for more information about installing MOVs on phone lines.

In electronic parlance, installing a device *across* a line means connecting it in parallel with the other devices on that line—that is, between the two wires that make up the phone line. Many phone cables have more than two wires, but it only takes a pair to make a phone line; by convention, the first line on a cable uses the red and green wires, while the second uses yellow and black. If your cable uses other colors, or you're not sure which two wires make up your phone line, ask someone who understands phone wiring to help you.

A few readers also pointed out that putting a single MOV across the two wires of a phone line doesn't protect against every possible kind of surge. While it protects against transverse mode surges, which occur across the two wires, it won't protect against common mode surges, which occur between the two wires and ground. To protect the line from both kinds of surges, you need to connect three MOVs in a triangle that includes the two wires of the line and a ground wire, as shown in **FIGURE 1**. Your telephone junction box should already contain a ground wire for its lightning arresters.

A few astute readers noted that the MOVs' varactor voltage—the voltage at which they begin to conduct—should be 170 volts or more. The Radio Shack MOVs listed in March's column meet this specification; if you use others, be sure to check the voltage ratings.

By Brett Glass

Brett Glass is a contributing editor for PC World. Help Line *welcomes your questions (see page 10 for contact information).*

Hot Wax and Jet Sprays Have Their Place. But Not In Quality Color Printing.

Introducing the world's only true 600x600 dpi desktop color laser printer.

The QMS® *magicolor* Laser Printer gives you output resolution that's twice that of enhanced color inkjet and thermal wax transfer. Fast and networkable, the QMS *magicolor*™ Laser Printer also offers extremely low consumable usage and cost unmatched by any other printer in its price range, with new features for even less money. Here's your chance to polish your image. For more information on how the QMS *magicolor* Laser Printer can make your work shine or the ColorSpecialist nearest you,

Call 800 972-6695 Dept. 4029.

QMS

For service on QMS and other products, call
800 762-8894 (U.S.) • Q-Fax 800 633-7213
E-mail: info@qms.com • Canada 800 263-5508

QMS Reference Price: QMS ColorScript Laser 1000 $7,999 • QMS *magicolor* Laser Printer 12 MB $9,999 • QMS *magicolor* Laser Printer 28 MB $10,999

QMS, the QMS logo and *magicolor* are trademarks or registered trademarks of QMS, Inc. One Magnum Pass, Mobile, AL 36618, 205 633-4300

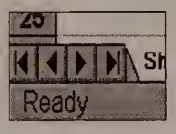
SPREADSHEETS Q & A

Skip to the Right Page in Excel 5.0

Q I've started using Excel 5.0's notebook page tabs to organize my worksheets. But I hate scrolling through dozens of tabs to find one sheet. Isn't there a quicker way?

Milford Questbach, Filbert, West Virginia

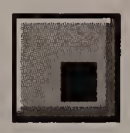
A If you right-click a tab scrolling button in the lower left corner of the worksheet window, Excel pops up a menu listing all the sheets in your file. To select a sheet, you just click its name.



Customize Your Excel 5.0 ToolTips

Q Excel 5.0's tool bars are easy to use: Put the mouse pointer on a tool and a little ToolTip box tells you what the tool does. But create custom tools and they always display the same uninformative ToolTip: 'Custom'. I've written a macro (see **FIGURE 1**) that lets you change the ToolTip on any tool bar.

To set it up, select *Tools•Record Macro•Record New Macro*, enter **ChangeTooltips** as the Macro Name, click *Options*, make sure *Personal Macro Workbook* is checked, and click *OK*. Click the Stop Macro button, then select *Window•Unhide* and *PERSONAL.XLS*. Click the last Module tab and edit the skeleton macro there until it looks like the one in Figure 1. Select *Run•Start* to test it, and choose *ChangeTooltips*. When done, select *Window•Hide*.



To edit the ToolTips (using Excel or custom tools), select *Tools•Macro•PERSONAL.XLS!ChangeTooltips*. A dialog box asks for a new description of each tool on the indicated tool bar. To edit the Tooltips for another tool bar, unhide PERSONAL.XLS and change the name in the 'Set MyToolbar' statement in the seventh line of the macro. To see a list of tool bar names, use *View•Toolbars*. Here's how it works:

Set MyToolbar = Toolbars("Standard") sets MyToolbar as the Standard tool bar.

ToolNumber = 1 denotes the tool currently being changed.

For Each Mytool In MyToolbar.ToolbarButtons begins a loop that repeats for every tool in the current tool bar. In each iteration, the current tool is called Mytool.

Message = "New DESCRIPTION for " + MyToolbar.Name + " tooltip " + Str(ToolNumber) defines text for the next dialog box.

Title = "Tooltip changer" defines the title for the dialog box.

Default = Mytool.Name defines the text that will appear in the dialog box as that of the current ToolTip.

If Not Mytool.IsGap Then skips the little gaps between some tools.

MyValue = InputBox (Message, Title, Default) shows the predefined dialog box and stores the result in MyValue.

If MyValue = "" Then End halts the macro if the user clicks Cancel. Otherwise **Mytool.Name = MyValue** changes the tool's name.

ToolNumber = ToolNumber + 1 bumps the counter for the next tool.

Have fun, y'all!

Roger W. Martin, Goodlettsville, Tennessee

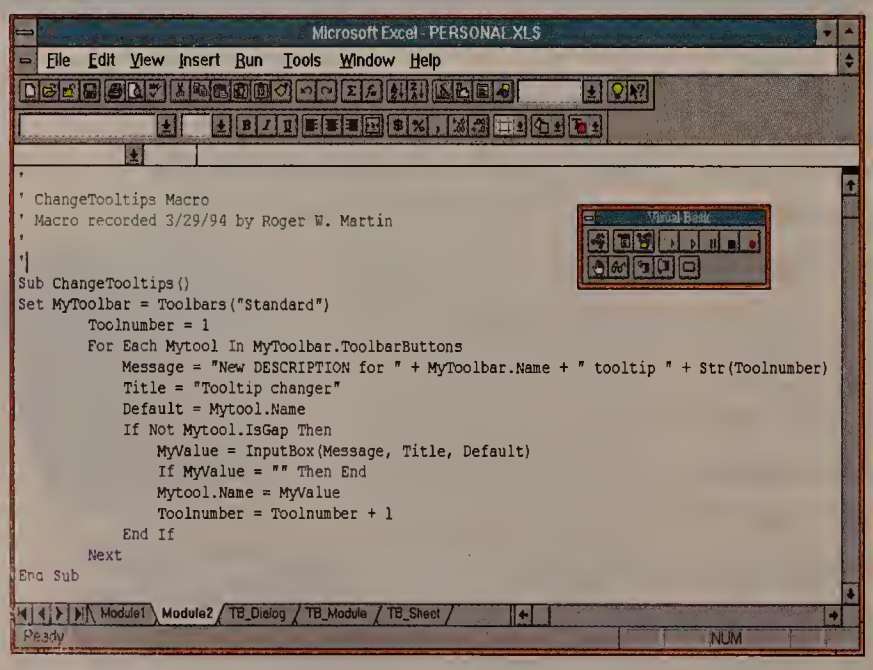


FIGURE 1: CREATE YOUR OWN CUSTOM TOOLTIPS descriptions with the assistance of this handy Excel 5.0 macro.

A Thank you, Roger—but, er, exactly what was your question?

USER GROUP TIP

Simplify Test Data

Test formulas in your spreadsheet by entering simplified test data—nothing but ones, for example—in the cells the formulas reference. That way, any errors you may have in your formulas will stand out more because you'll be able to predict their results easily.

Jerry McCloud
Channel Islands PC Users Group

Formatting Graph Axes in 1-2-3

Q I'm using 1-2-3 to create *x-y* graphs that display dates on the *x*-axis and quantities on the *y*-axis. But things aren't turning out quite like I planned. The problem is, the graph's *x*-axis displays the date code numbers (for example, 33703) instead of the formatted dates that appear in the cell (4/9/92). How do I make the proper dates show up on my graph?

John Knobeloch, Orangeburg, South Carolina

A Happily, a simple solution exists. Let's assume your graph is an *x-y* plot. In releases 2.*x* and 3.*x*, select */Graph•Options•Scale•X-Scale•Format•Date*, and choose the format you need. In release 4.*x* for Windows, right-click one of the *x*-axis labels, choose *Number Format* from the pop-up menu, and select a date format from the list.

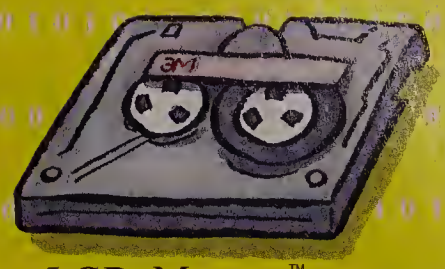
Averaging in Windows Spreadsheets

Q My 1-2-3 spreadsheet contains five columns of class grades, and I want to eliminate the lowest two values for each column, then determine the average of the remaining grades. How would I accomplish this?

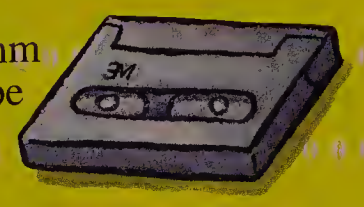
Ernest Wetherby, Joliet, Illinois

A You didn't indicate which version of 1-2-3 you're using. I hope that it's release 4.0 for Windows, because unfor-

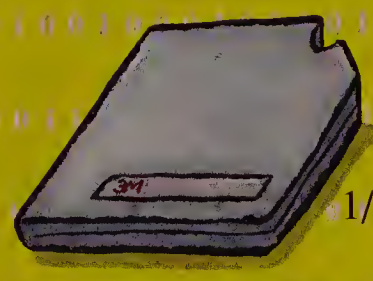
The path to follow whichever storage option you choose.



5 GB–Magnus™
Data Cartridge



5 GB – 8mm
Data Tape

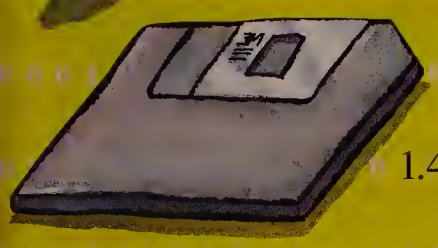


2.4 GB – ECart™
1/2" Tape Cartridge

2 GB – 4mm
Data Tape

1.3 GB–Rewritable
Optical Disk

255-750 MB – MC3000
Minicartridge



1.44 MB–High Density Formatted Diskette

Whatever capacity you need, whatever technology you choose, 3M has a proven, reliable solution. In fact, users rate 3M brand diskettes and quarter-inch cartridges number one in reliability – and overwhelmingly prefer them over other brands. So whether it's our enhanced performance diskette, Rewritable Optical, 4mm or 8mm data tapes, ECart™ 1/2″ tape cartridge or the multi-gigabyte capacity of quarter-inch cartridges – we're ready to grow with you. That's why more businesses protect important information on 3M brand data storage products than any other brand in the world. Find out more. Call 1-800-888-1889, ext. 1104.

3M data storage products require compatible drives. "ECart" and "Magnus" are trademarks of 3M. Preference and reliability ratings based on independent research.
© 3M 1994

3M *Reliability*

Circle 208 on reader service card

Master Class: Building Spreadsheets Other People Can Understand

New job, new city, new life! After all the negotiations, the expressions of confidence, and the exhilaration of the move, it's finally time to work. Luckily, your predecessor, Sheetmeister, has promised to spend a full week showing you the ropes. But just when you're ready to start, it's Sheetmeister on the phone: "Sorry for the change of plans, but my schedule has accelerated. We'll have to skip the training. But hey, the job practically does itself! It's all in the worksheets on your PC. They're pretty self-explanatory. Bye."

They'd better be. Well, no big deal—you're no slouch with a cell pointer yourself. You fire up the spreadsheet and open the first file. Let's see, what are those labels: INADV, LTD? How about those columns of unidentified numbers and cryptic formulas like @SUM(B:D11..B:D14)*(1/C43)-101.4? Four hours later, your palms are sweating. This stuff is spaghetti! Why don't people build spreadsheets other people can understand?

Why, indeed? The problem of cryptic spreadsheets is as old as the PC itself, but here are six rules of thumb to help spare your successors (and yourself) this kind of torment.

1 Provide documentation. In 3-D worksheets, reserve the first sheet to list all the other sheets. In 2-D worksheets, such as 1-2-3 release 2.*x*, Quattro Pro for DOS, and Excel 4.0, use the diamond-back system (where each functionally separate area is below and to the right of the preceding one), reserving one area for documentation. Provide directions on using the worksheet—where to enter data and how to print the reports. List macros and how to use them. You might also include an list of ongoing revisions, so later you (or your successor) can match up reports with a specific version of the worksheet. If you write macros, provide a line-by-line explanation of how they work. In Quattro Pro for Windows and DOS, 1-2-3 for Windows and DOS, and Excel 4.0, use a column next to the macro code for comments; in Excel 5.0, use an apostrophe at the beginning of a comment to intersperse the comment with macro statements.

2 Separate data entry areas from reports. Printed reports are often brief and stylized, without room for you to provide the labeling others need to enter data intelligently. So it's helpful to put the data entry area onto one page of your worksheet file and use a separate page to design a report that's easy to understand. Your data entry page can include instructions, definitions, the phone number to call when there are questions, and so forth. Organize things in the order most convenient for entering data, and label each section clearly; avoid peculiar acronyms and abbreviations. Then use formulas to link the report page back to the data entry page.

3 Name everything—systematically. Make your formulas easier to interpret by assigning names to ranges and cells that contain key values. When future generations peruse your work, they'll see @IF(HOURS_USED>FREE_HOURS,FEE*(HOURS_USED-FREE_HOURS),0) instead of @IF(B2>B9,C3*(B2-B9),0). To keep range names organized, assign names to the pages of your multipage worksheets—for example, DATA_ENTRY and EASTERN_SALES. (If you're using 1-2-3 release 3.*x*, assign a special range name in the top left corner of each page as a substitute for the sheet name provided in Windows spreadsheets.) Then give each range name a two-character prefix to identify the page it's on, such as ES_COMMISSIONS and ES_PROJECTIONS for those ranges in the Eastern Sales sheet. While you're at it, use a similar scheme to name charts, graphic objects, 1-2-3 Query objects, and other items.

4 Make data cells distinctive. In every spreadsheet, some cells contain formulas, while others hold data values—numbers you type directly into the cells. Make it easy to see the difference: Change the text color of the cells, the cell shading, whatever. But do it consistently so it's easy for your successor to see quickly which numbers are calculations.

5 Never put a constant into a formula (unless the constant has been immutably determined by the laws of physics). If you've buried next year's assumed rate of inflation as a constant in 12 different formulas in your worksheet, you've ensured that no one but you will understand the projected results. If a number has any meaning at all, put it in a cell with a label that explains what it is.

6 Adopt a standard report footer and use it on every spreadsheet report. Make the footer include the name of the file that generated the report, the date and time, and the page number (preferably in "Page *x* of *y*" format). That way, when your protégé finds page 13 of the strategic plan squirreled away behind the filing cabinet, she'll know exactly where it came from.

So why go to all this trouble? Well, it's not merely the right thing to do. If you ever get hit by a bus, your successor will thank you in a silent prayer. But most of all, the more self-explanatory your worksheets are, the less time you'll spend explaining them in person.

tunately DOS versions 2.*x* and 3.*x* lack the SMALL functions that are necessary to make this solution work. (It won't work in Quattro Pro for DOS, either). Let's postulate that your grades are located in a range named GRADES. Then try out the appropriate spreadsheet formula indicated below:

1-2-3/W: **(@SUM(GRADES)-@SMALL(GRADES,2)-@MIN(GRADES))/(@COUNT(GRADES)-2)**

Quattro Pro for Windows 5.0: **(@SUM(GRADES)-@SMALLEST(GRADES,2)-@MIN(GRADES))/(@COUNT(GRADES)-2)**

Excel 4.0 and 5.0: **=(SUM(GRADES)-SMALL(GRADES,2)-MIN(GRADES))/(COUNT(GRADES)-2)**

The logic of the formula is uncomplicated. In all three programs, you simply take the sum of the numbers, subtract the smallest value in the range, which is @MIN(GRADES), and the second smallest value, @SMALL(GRADES,2), then divide by the number of values in the range, less 2.

By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software consultant based in Chapel Hill, North Carolina.* Spreadsheets *welcomes your questions (see page 10 for contact information).*

WE BEAT THE PANTS OFF OUR COMPETITION.

NOW WE'RE GOING TO KNOCK YOUR SOCKS OFF!

AT&T PRESENTS RIO 6.3 - THE FASTEST, EASIEST, MOST POWERFUL GRAPHICS SOFTWARE IN THE WORLD.

For almost a century, AT&T has provided **INNOVATIVE** technology designed to help you communicate. With the new RIO 6.3, AT&T gives graphic artists and corporate users **POWERFUL** drawing tools to communicate their ideas with ease. We're talking about features that you can use to produce the kind of graphics commonly seen on television. Imagine automatically generating a shadow for any text or object and controlling the light source, intensity, and drop. How about adding filters such as emboss, posterize, and soften to vector images – this is **THE BEST** of drawing and paint programs combined! Its ability to morph and envelope text is **UNSURPASSED**. We've even included 250 high-quality PostScript fonts to get you started. All this power and lightning **FAST** too, that's how we beat the pants off our competition. • The list of features goes on, but the best feature right now is our unprecedented offer. The first 50,000 respondents can purchase RIO 6.3 for only $99. RIO normally sells for $495...whoa! Better yet, you can try it **FREE** for thirty days! When you see RIO perform, and experience how **EASY** this graphic powerhouse is to use, it'll knock your socks off! So call now and order your copy to use for **FREE**.

- Over 250 PostScript Type-1 fonts
- Has the best of draw (vector) and paint (raster) programs
- Text enveloping & fit text to paths
- 24-bit interactive display
- Emboss, pixelize, posterize, soften, negative, & grayscale
- Map images and textures to any shape or text
- Object and text blending
- Multi-color radial and linear gradient fills

AT&T

CALL 1-800-319-7349

Circle 4 on reader service card

WORD PROCESSING Q & A

Lining Up ASCII Columns in Windows Word Processors

Q I often have to download long ASCII text files from various sources on the Internet. Most of these files contain tables that use spaces to line up the columns. To make printing easier, I usually load these text files into Word 2.0 for Windows. But when I do this, the columns don't line up anymore. Is there any way I can load these files into Word without messing up the tables?
Alvin Mappala, Shawnee, Kansas

A You're having trouble lining up those pesky ASCII columns because the DOS-based files you're getting online are based on *fixed-width* characters. Most Windows fonts, by contrast, are *proportional*, meaning the characters have different widths. As a result, columns that lined up just fine in an ASCII file are all out of whack when you look at them in Windows.

The solution is to use a fixed-width font in your Windows word processor. Unfortunately, there aren't a lot to choose from. I'd suggest Courier New. This fixed-width font comes with Windows 3.1 and can be scaled to any size. To apply it in Word, select the text you want to change, then select *Format Font*, then pick *Courier New* from the program's font list.

Switching Print Order in WinWord 6.0

Q I use Microsoft Word 6.0 for Windows and have both a Hewlett-Packard DeskJet 550C ink jet printer and an HP LaserJet 4P. I'd like to print pages in reverse order on the DeskJet and in the normal order on the LaserJet. Is there an easy way I can do this in WinWord?
Collin Evans, Racine, Wisconsin

A There sure is. Give the *File•Print* command, then select the DeskJet (assuming it isn't already selected) by clicking *Printer* in the Print dialog box, choosing *DeskJet* from the Printers list, and clicking *Close*. When you return to the Print dialog box, select *Options*, then check the *Reverse Print Order* box under Printing Options. Click *OK* to leave Options, then click *OK* again to print your document.When you want to print with the LaserJet, follow the same procedure to select it as the printer, then make sure the Reverse Print Order box is *not* selected.

Had It With WordPerfect 6.0 for Windows

Q I installed WordPerfect 6.0 for Windows the week it came out, and I've had nothing but trouble ever since. I've been plagued with nearly constant General Protection Faults, terribly slow printing, and other problems. One time, the program wouldn't even run, and I had to install it again from scratch. There must be some solution to this. I've tried calling WordPerfect's technical support, but all I get are busy signals. I don't want to switch to another program, but I'm at my wit's end.
Barbara Martin, Boston

A You are not alone. Virtually as soon as WordPerfect 6.0 for Windows shipped, it was clear to everyone (including WordPerfect Corporation) that the program had some serious shortcomings. Since then, the company has been working hard on an interim release to fix these problems, but there have been delays in shipping that version as well.

In April, the company finally shipped version 6.0a. This revision gets rid of almost all the bugs in the initial release and offers some actual improvements as well, including QuickCorrect, which automatically corrects common spelling errors as you type; better file conversion tools; improved speed; and lower hard disk requirements.

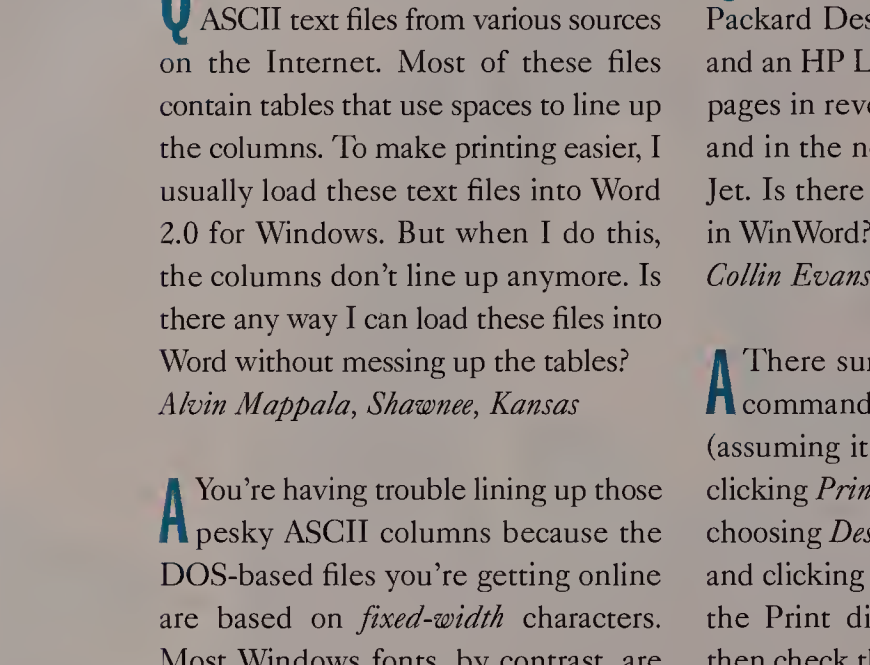
Registered users of WordPerfect 6.0 can call 800/321-4566 to request their free copy of this update. If you forgot to send in your registration card, don't worry: You'll be able to register when you call. One note: Don't delete your current copy of WordPerfect 6.0 from your hard disk. The interim release won't install without it.

Indenting Text in WordPerfect 5.2 for Windows

Q Why doesn't WordPerfect 5.2 let me set temporary indentations for text? I often have to incorporate quotes from poems in my papers for school. Normally, when I turn on text formatting in WordPerfect, it stays in effect until I turn it off. But if I press <F7> to activate the Indent command, type a line of the poem, and press <Enter> to start a new line, WordPerfect returns to the normal margins. Isn't there some way to tell the program I want indentation to stay on until I turn it off?
John Ziv, Oyster Bay, New York

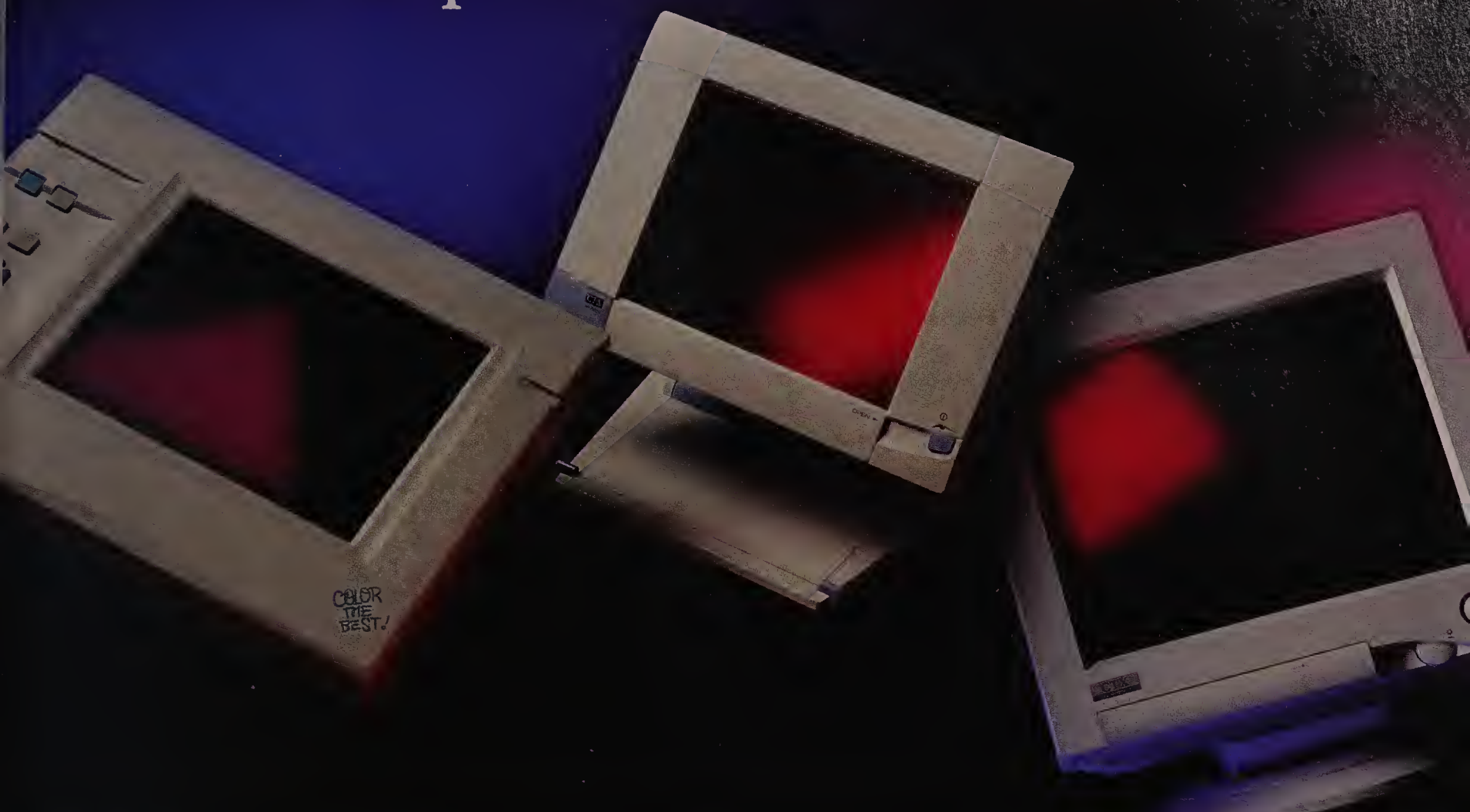
A I was surprised to discover this seeming lapse in the program. I expected I'd be able to select a block of text and then press <F7> to indent the whole thing. But since the Indent command doesn't work on blocks of text, here's a work-around:

Instead of indenting each line with the <F7> key, type your poem in just as



PRINTING PAGES IN REVERSE ORDER in Word 6.0 for Windows is just one of your choices when you select Print • Options.

We've Got Lots Of New Ways To Help You Show Your Stuff.



Welcome to the monitor capital of the world. Where just the right CRT or LCD display is waiting for you.

Take our new high-resolution, flicker-free, 17-inch Super VGA "green" monitors. A low 0.26mm dot pitch makes images crystal clear. And viewing is easier on your eyes and body thanks to a special flat, square, anti-glare, anti-reflection, anti-static screen; low MPR II radiation standards and handsome ergonomic design.

Their larger size and controllability make them ideal for complex Windows™, Mac® and SPARC® applications.

They're easy on your pocketbook too. And not just because of their low initial price and two-year warranty. When "on" but inactive, power consumption goes down from 130 watts to less than 5 watts. Imagine the cost savings if you had ten monitors. Or a thousand.

CTX GREEN MONITOR FEATURE SUMMARY

MODEL	6468GM	1451GM	1462GM	1562GM	1565GM	1765GM	1785GM
Size	14"	14"	14"	15"	15"	17"	17"
Dot Pitch (mm)	0.28	0.28	0.28	0.28	0.28	0.27	0.26
Hor. Freq. (KHz)	30-38	30-50	30-62	30-62	30-65	30-65	30-85
1600 x 1280 NI	—	—	—	—	—	—	Yes(60Hz)
1280 x 1024 NI	—	—	—	—	Yes(60Hz)	Yes(60Hz)	Yes(75Hz)
1024 x 768 NI	87Hz/I	60Hz/NI	75Hz/NI	75Hz/NI	75Hz/NI	75Hz/NI	75Hz/NI
Mac Compatibility	—	—	Yes	Yes	Yes	Yes	Yes
Flat Square	—	—	—	Yes	Yes	Yes	Yes
Color Match	—	—	—	—	—	Yes	Yes
Digital Controls	—	—	—	—	Yes	Yes	Yes
MPR-II & ISO9241-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Savings	<30W	<30W	<30W	<30W	<5W	<5W	<5W

For full-time low power, no radiation and even more versatility, check out our handsome, new LCD monitors.

Their active-matrix displays provide bright, sparkling color (and b/w) even when viewed from wide angles. They weigh less than six lb. and can even be wall mounted.

For even bigger shows, our low-cost LCD projection panel can turn your whole wall into a computer monitor. It's flicker-free, shows millions of colors and comes complete with on-screen menus, freeze frame and enlargement capability, a patented overhead projector light blocker, wireless remote control and its own rugged carrying case.

More than one million CTX monitors were purchased by computer professionals in the U.S.A. last year. Call us today and find out why.

CTX

We just make great monitors.

energy EPA POLLUTION PREVENTER

ISO 9000

For more information, contact the CTX regional office nearest you: **USA Headquarters** 20530 Earlgate Street, Walnut, CA 91789, 909-595-6146, Fax 909-595-6293 Technical Support 1-800-888-2012 BBS 909-594-8973 **Southern Region** 6624 Jimmy Carter Blvd., Norcross, GA 30071, 404-729-8909, Fax 404-729-8805 **Eastern Region** 481 Edward Ross Drive, Elmwood Park, NJ 07407, 201-646-0707, Fax 201-646-1998 **Midwestern Region** 500 Park Blvd., Ste. 295C, Itasca, IL 60143, 708-285-0202, Fax 708-285-0212 **Southwestern Region** 1225 E. Crosby Rd., Ste. A21, Carrollton, TX 75006, 214-416-9610, Fax 214-245-7447.

©1994 CTX International, Inc. All brand names are trademarks or registered trademarks of their respective owners.

Circle 74 on reader service card

you would normal text. After you've typed in all the lines, press **<Enter>** once more to add an extra line at the end of the section to be indented. Next, select all the lines of the poem with the mouse or keyboard. Select *Layout•Margins,* and enter a new value for the left margin in the subsequent dialog box. Finally, click *OK.* That's all there is to it. Your selected text should all conform to the new margin.

If you need to indent sections of text frequently, use the WordPerfect macro recorder to create a margin-resetting macro, and assign a shortcut key combination to it.

File Bloat in WinWord 6.0

Q I recently switched from version 2.0 of Word for Windows to the new 6.0 release. I was surprised to find that the file size for a simple three-paragraph letter jumped from 3K in version 2.0 to 11K in version 6.0. This has the potential for eating up a lot of extra hard disk space. Is there anything I can do to reduce the size of these files?
David A. Yount, Onarga, Illinois

A Many users have encountered this file-bloating problem in the new version of Word for Windows. The culprit: WinWord's new multilevel undo feature. To make 100 levels of undo possible, the program stores all of your editing and formatting changes in the document file.

That arrangement would be fine except for one thing: By default, WinWord's Fast Save feature is enabled. With Fast Save turned on, the program doesn't dump your additions and deletions when you save your document. And so your files grow in size.

The solution is to turn off Fast Save. To do this, select *Tools•Options* and click the *Save* tab in the Options dialog box. Then uncheck the *Allow Fast Saves* box and click *OK.* From now on, WinWord will dump that excess material when you save a document, and your files should shed some of those unwanted bytes.

The only drawback to turning off Fast Save is that it may take a few seconds longer to save your documents. These delays could slow you down a little if you use WinWord's Automatic Save feature to save your work. The choice is yours.

Importing WordPerfect Macintosh Files

Q My office has a mixture of Macs and PCs. Everybody uses one version or another of WordPerfect, but I'm the lone holdout who's still using WordPerfect 5.1 for DOS. Is there any way for me to import files generated in WordPerfect 3.0 for the Macintosh?
Denise Whittle, Oakland

A While WordPerfect 5.1 for DOS doesn't include an import filter for the Macintosh version, WordPerfect recently released WordPerfect 5.1+ for DOS, which handles Macintosh files just fine. What's more, the new version of this classic program can also import and save files in WordPerfect 6.0 format, which should help you keep peace with those users in your office who have already upgraded.

Other additions in WordPerfect 5.1+ include support for fax cards and E-mail; special editions of ScreenExtender, a utility that keeps your text from running off the right edge of the screen; and Bitstream's FaceLift, which gives DOS users access to scalable fonts. WordPerfect has also improved mouse support and drop-down menu access with this release of the program. The upgrade costs $49.95 for licensed users of version 5.1. Contact WordPerfect Orders and Information at 800/321-4566.

Getting Back to Normal in Ami Pro

Q I've run into a formatting problem in Ami Pro 3.01 that I just don't understand. Suppose I select a paragraph and then use Text•Font to change its font. So far, so good. But then let's say I mistakenly change part of the paragraph to italics. I thought I could get the text back to normal by pressing <Ctrl>-N, but when I do this, Ami Pro changes the whole paragraph back to the font I replaced. I just want to get rid of the extra font formatting. How do I get things back to normal?
Alexandria Wilson, Los Angeles

A The problem is that Ami Pro's <Ctrl>-N command switches your text back to the normal *style* for that paragraph. That means you get the normal style's default font too, and that's not what you want.

You can remove the unwanted font formatting with the same <Ctrl>-*key* shortcuts you're using to apply it. For example, if you've boldfaced a block of text, you can remove the boldfacing by reselecting the text and pressing **<Ctrl>-B.** To remove the unwanted italics, all you have to do is select the text you want de-italicized and then press **<Ctrl>-I.**

You should know that this same toggling technique works no matter how you applied the formatting. For example, if you used one of the SmartIcons to format selected text, you can click the same icon to remove the formatting. If you formatted text with commands in the Text menu, select the same commands to reverse the effect.

By George Campbell

George Campbell is a contributing editor for PC World. Word Processing *welcomes your questions (see page 10 for contact information).*

POWER TIP no. 311

Turn Off 386MAX Messages

Qualitas's 386MAX memory manager has the annoying feature of displaying a memory map and registration information every time that one of its commands is run in AUTOEXEC.BAT and its drivers are loaded by CONFIG.SYS.

You can prevent these annoyances from occurring by entering a space and then typing the word terse after each occurrence of 386MAX.SYS, 386LOAD.SYS, and 386MAX.PRO in your configuration files. For example, you might have the lines:

```
DEVICE=C:\386MAX\386MAX.SYS terse
pro=c:\386MAX\386MAX.PRO terse
```

Graham Langford
Pickering, Ontario, Canada

There's on the keyboard,

there's a in the printer,

there's in the A: drive,

there's an on the front,

there's only one way to fix it good as new.

Whether it's a mouse or a mainframe, the parts you fix it with should be the same kind we made it with– high-quality, rigidly tested, warrantied IBM parts.

We have a full range of parts for all IBM products, including older systems like PC/XTs™ and System/36s, and you can get exchange prices on selected items.

What's more, IBM parts are always available, and so are we. You can call us toll free 24 hours a day, 7 days a week for orders or price quotes, and, yes, we'll be happy to accept your Visa, MasterCard or American Express.

IBM®

IBM PARTS

For orders or price quotes call anytime:

1 800 388-7080

©1994. IBM is a registered trademark and PC/XT is a trademark of IBM Corporation.

WINDOWS Q&A

The Case of the Invisible Program

Q When Windows starts, I get this strange error message: 'Cannot find file specified in WIN.INI (or one of its components)'. I have searched every INI file on my hard disk for the source of this problem, with no results. Any solutions for this?
M. Murphy, PC World Online

A This error message pops up when you—or, more likely, a clumsy installation program—add an extra space or comma to the load= line of WIN.INI. This line can start any number of apps, as long as it doesn't exceed 127 characters, and the executable file names are separated by a single comma or space, but not both. If an unnecessary comma or space is inserted after a file name, you will get this perplexing message.

To banish the message forever, simply select *File•Run* in either Program Manager or File Manager, type **WIN.INI**, and press **<Enter>**. This sequence displays WIN.INI in Notepad. Locate the load= line near the top of the file, delete any extra commas or spaces, and save the file. You won't see the error message the next time Windows loads.

Maximize Screen Real Estate

Q I run a lot of programs on screen at the same time, and my desktop is running out of room. Since my video setup can't jump to a higher resolution, can I cram more stuff on screen by getting rid of title bars?
Gina Moensch, Sioux City, Iowa

A You can't eliminate title bars, but you can hide them by nudging them off screen. The trick is using Windows' keyboard shortcuts (rather than the mouse) to move and size an app's window. A possible bonus: If programs remember their last positions—as Program Manager, File Manager, Word 6.0 for Windows, and others do—you won't have to arrange them every time you load Windows.

Shoving a title bar out of view is easy: Select the application window that normally sits at the top of the screen and press **<Alt>-<Space>** to open its control menu. To stretch the window so that its title is moved off screen select *Size*, press the **<Up>** key until the title bar slips out of view, then press **<Enter>**. To move the window lock, stock, and title, select *Move* and follow the same steps. (Should the Move and Size commands be dimmed on the control menu, just select *Restore* first.)

If your application has a save settings feature, turn it on; then exit the program, reload it, and turn off the feature. Your new space-saving arrangement is now the default. If you're using Program Manager or File Manager, uncheck *Save Settings on Exit* in the Options menu, and hold down **<Shift>** while selecting *File•Exit*. This preserves the new settings without closing either program.

Printing Help

Q Is there a way to print more than one Windows help file topic at once?
Gus Roessler, Grand Island, Nebraska

A Considering how frequently this question is asked, you would think that Microsoft would include a "print all topics" feature in Windows Help. But so far it hasn't. Your only recourse is to copy each topic to a word processor and then print it from there. The good news: It's easy.

In File Manager, first double-click the HLP file that runs WINHELP.EXE and opens the file. Click to display the desired topic, and press **<Ctrl>-<Insert>** to copy the entire topic to the Windows Clipboard. Then load your word processor and press **<Shift>-<Insert>** to paste the topic in. Make sure that you leave the cursor at the bottom of the page so that you can easily paste in the next topic. Press **<Alt>-<Tab>** to return to Windows Help and navigate to the next topic.

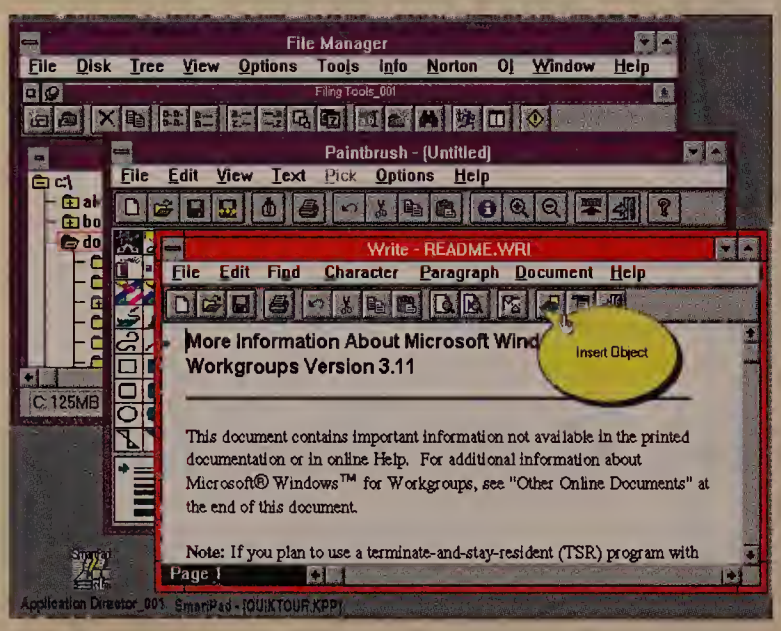
Repeat the steps until you have all the topics you want to print in a single document. Format it and print away.

Sizing Up Directories: A Better Way

Q In your April column, you describe a DOS batch file that calculates how much disk space the files in a subdirectory and its subdirectories take up ["Size Up Directories With File Manager—and DOS"]. The idea was to determine whether the files in the selected subdirectories could fit on a floppy.

While your approach works, it has

Windows Toolbox



SmartPad 3.0 may be the tool bar utility to end all tool bar utilities. You can use it to attach tool bars to any application (including DOS programs running in a window) and even create a custom tool bar to replace Program Manager. Tool bar buttons can launch programs, documents, and editable SmartPad macros that can make DDE calls. The interface is somewhat cluttered, but the program makes up for this tiny gaffe by giving you a ton of customization options. Softblox, Inc., $95; 404/892-0202, 404/892-0981 (fax). Reader service no. 718

The ZEOS® Pantera™ Is The #1 Pentium PC.

We could fill this page with self-indulgent comments about how technically superior our Pentium processor-based systems are, how they perform far better than the competition, how great a value they are–and so much more. But why listen to us, the manufacturer, when top editorial experts at seven leading publications said the same thing–and far more eloquently.

PERFORMANCE:

"At the top is the new ZEOS Pantera-66, a Pentium-66 that recorded the fastest benchmark results ever to come out of the PC World Test Center."
PC World, Best Buy, June 1994

"In terms of performance, the Pantera-66 left little to be desired…this machine scored high consistently and laid claim to no low scores whatsoever."
PC Magazine, Editors' Choice, April 12, 1994

VALUE:

"ZEOS Pantera-66 combines quality features, good price, and high performance..."
PC Magazine, Editors' Choice

"A standout in speed and value…we suggest you spend your money on this machine–it offers the best value of any system we tested…this is a deal you simply can't pass up."
PC/Computing, BEST, May 1994

THE EXPERTS CONCLUDE:

"…one system stands out from the rest: the ZEOS Pantera."
Windows Sources, Experts' Pick, June 1994

"…the most desirable computer in the group."
Computer Shopper, Top Choice, April 1994

"…there's no doubt which machine you should choose: ZEOS's Pantera-66."
PC/Computing, BEST

OK, so maybe we were a little indulgent, but that's what the experts said–and they all agree that the ZEOS Pantera is the top choice. Make it your choice. Call a ZEOS Systems Consultant today.

PC MAGAZINE EDITORS' CHOICE April 12, 1994 · PC WORLD BEST BUY June 1994 · Windows SOURCES EXPERTS' PICK August 1994

PC MAGAZINE EDITORS' CHOICE, PC WORLD BEST BUY, WINDOWS SOURCES EXPERTS' PICK & COMPUTER SHOPPER'S "TOP CHOICE"

PENTIUM-60 .....$2995
PENTIUM-66 .....$3095
PENTIUM-90 .....$3395

- Intel 60MHz, 66MHz or 90MHz Pentium CPU
- 16MB RAM, 256K SRAM cache
- 528MB local bus IDE hard drive, 256K cache
- 2X CD-ROM drive, 3.5" 1.44MB floppy disk drive
- Diamond Stealth 64/PCI local bus SVGA color graphics card with 2MB VRAM
- ZEOS 15" 1024 x 768 NI SVGA color monitor, .28mm
- 2 high-speed (16550) serial ports, 1 enhanced parallel port
- 3 PCI slots, 5 ISA slots
- Integrated business audio
- On-board SCSI socket
- Flash BIOS
- 10-bay vertical case with two cooling fans
- 101-key space-saving keyboard
- MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse, choice of Lotus application

PC Computing BEST May 1994 · Windows SOURCES EXPERTS PICK June 1994

PC/COMPUTING BEST & WINDOWS SOURCES EXPERTS' PICK MULTIMEDIA SYSTEM

PENTIUM-60 .....$3538
PENTIUM-66 .....$3638
PENTIUM-90 .....$3938

Above PC modified to include:

- 16-bit sound card
- Amplified stereo speakers
- 17" 1280 x 1024 NI SVGA color monitor, .28mm, upgrade

CALL NOW TOLL FREE
800-554-5220

Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders: Government: 800-245-2449, Outside U.S. and Canada: 612-362-1212. Purchase Orders, MasterCard, VISA, Am Ex, Discover, Z-Card,™ COD and affordable leasing programs.

ZEOS THE PENTIUM PROCESSOR SOURCE

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease; 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. Intel Inside and Pentium are trademarks of Intel Corporation in the USA and other countries. ZEOS is a registered trademark; Z-Card and Computers Now! are registered servicemarks; Pantera is a trademark of ZEOS International Ltd. © 1994 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS). PEN-PCW-9409

SIZE UP DIRECTORIES AND ALL THEIR FILES with some seldom-used commands in File Manager.

annoying limitations; for example, you can't tell whether a directory would fit if you left out certain files. I have a much simpler solution: Use the hidden power of File Manager's Search function.

To check the size of a directory and its subdirectories, select its folder icon in File Manager, then select *File•Search*. Make sure that the Search For text box contains ***.*** and that the Start From text box shows the directory name (both should be in place by default); then check the *Search All Subdirectories* option. Click *OK*, and File Manager will display all of the files in the Search Results window. Press **<Ctrl>** and the slash key to select all the files, then press **<Alt>-<Enter>** for file properties. The resulting dialog box displays the total number of files and total disk space consumed.

To exclude certain files from the total—for example, TXT files—press **<Esc>** to close the Properties box, then choose *File•Select Files*. Type ***.TXT**, click *Deselect* and *Close*, then select *File•Properties*. This time you'll see the size of the directory, minus the TXT files. You can automate this sequence with a Recorder macro.

Brian Palmer, Las Cruces, New Mexico

A An excellent tip, Brian! We stand corrected—and informed.

Repairing Icon Labels

Q Recently I deleted some fonts that I wasn't using, via the Fonts feature in the Control Panel of Windows. Now my Program Manager icon labels have shrunk and look like they're in Courier. What did I do?

Robert Martin, PC World Online

A You apparently deleted the MS Sans Serif font, the Windows default for icon labels. You can either restore it from your original Windows disks or specify a different font in WIN.INI.

To restore the original font, get out your Windows installation floppies and look for the SSERIFE.FO_ file (if you run Windows in VGA mode) or SSERIFF.FO_ (for super-VGA mode). The underscore ▶

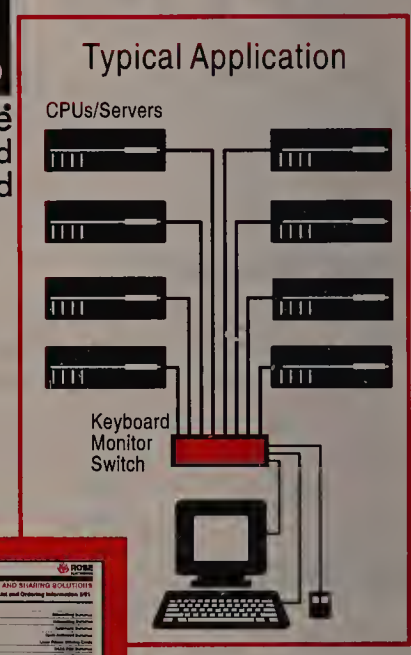
Your Choice of Keyboard Monitor Switches

Access multiple computers with a single keyboard and monitor to cut equipment costs, save valuable space, and end clutter

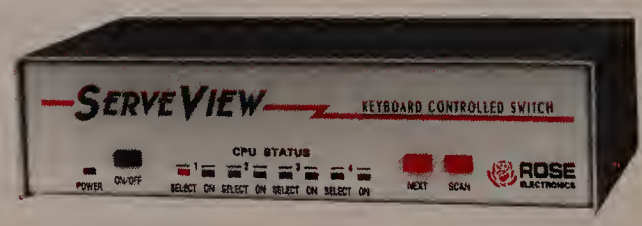
yes NetWare Tested and Approved

Manually controlled unit

- Simple pushbutton operation for quick selection
- Four, eight, or twelve ports per unit
- Daisy-chaining connects unlimited number of CPUs
- Compatible with EGA, VGA, Macintosh, Sun, and others
- Optional keyboard booting for 286, 386, and 486
- Optional RS232 or PS/2 mouse interface
- PCB construction for high reliability and low crosstalk
- Rack mount, matrix, and customized units available



- Switch by keystroke, from front panel, or RS232 port
- Two or four ports per unit
- Cascade units to support up to 255 CPUs
- Supports monochrome, EGA, and VGA
- Includes keyboard booting for 286, 386, and 486
- Includes RS232 and PS/2 mouse interface
- LEDs display selected CPU and CPU power-on
- Scan function switches among CPUs automatically



Keyboard controlled unit

Call toll-free now for your copy of our Switching and Sharing Solutions catalog

Other Rose products: Print servers, printer sharing units, print buffers, keyboard monitor extenders, video splitters. All Rose products are US-made and have a 1-year warranty

Make the Rose Connection

ROSE ELECTRONICS

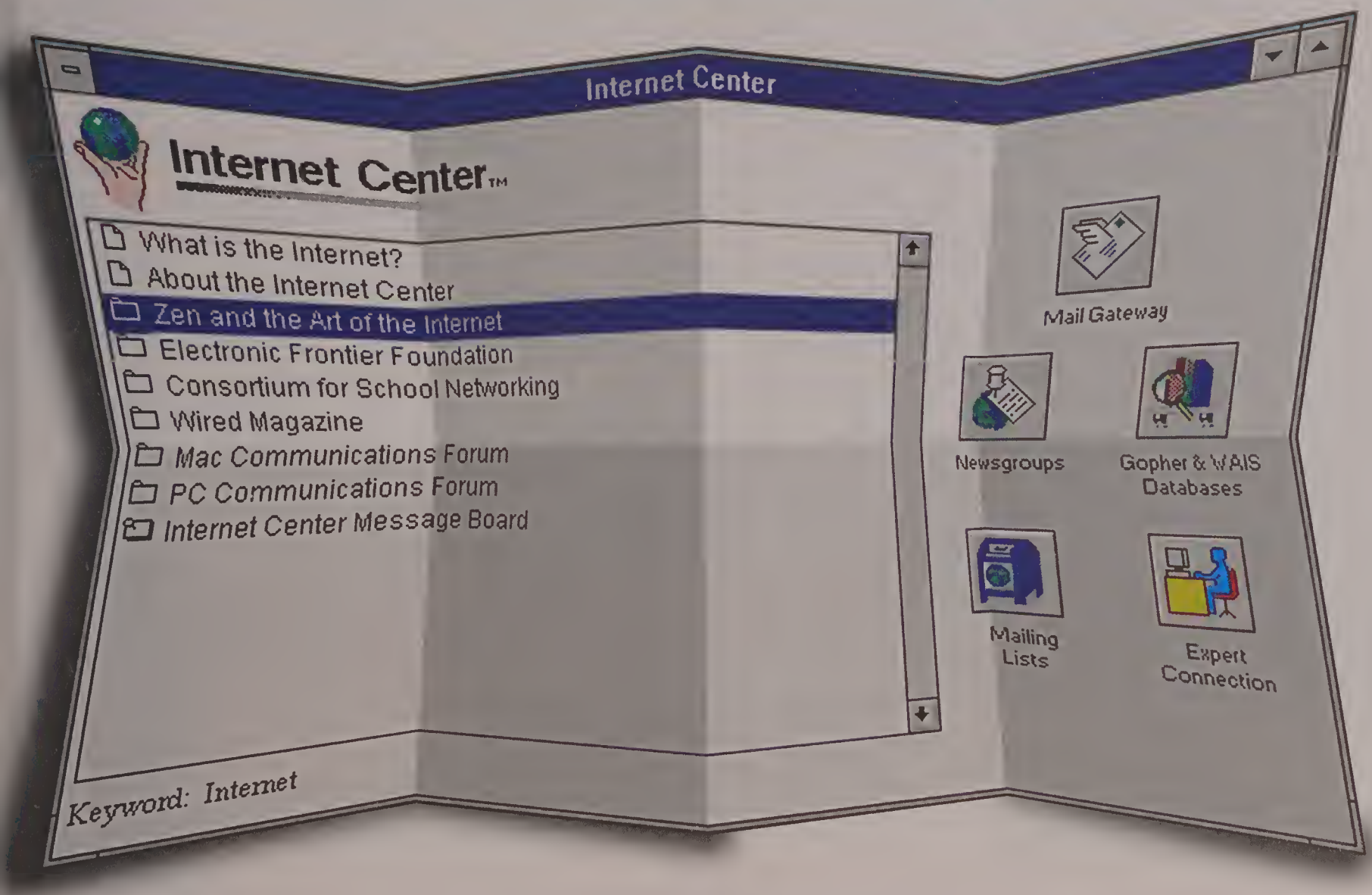
10850 Wilcrest Drive • Houston, Texas 77099 • Phone (713) 933-7673 • Fax (713) 933-0044

1-800-333-9343

PCW INFO HOTLINE: INSTANT FAX BACK
1-800-234-0455 ext. 145

Circle 209 on reader service card

Your Road Map For The Information Superhighway—America Online®



See other side for details of your FREE trial offer from America Online!

10 FREE TRIAL HOURS! Then just $9.95 per month, including 5 free hours and no sign-up fee!

AMERICA Online®

1-800-827-6364, Ext. 4025

Yes! I'd like to try America Online—FREE.

Send me the free software and trial membership. I understand there's no risk—if I'm not completely satisfied, I may cancel without further obligation.

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

( ) HOME PHONE _____

SELECT DISK TYPE AND SIZE —

Windows*: ❑ 5.25 ❑ 3.5

DOS: ❑ 5.25 ❑ 3.5 ❑ High Density ❑ Low Density

Apple®: ❑ Macintosh®3.5

*To use America Online for Windows, you must have a 386 PC or higher, 4MB of RAM, a VGA monitor, a mouse, a modem, and a working copy of Windows 3.1.

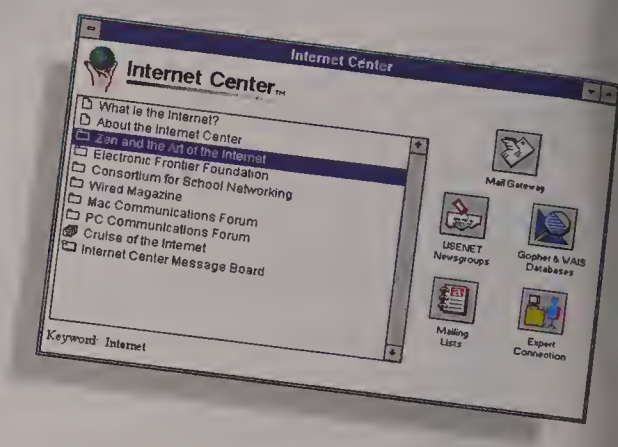
Use of America Online requires a major credit card or checking account. Limit one free trial per household. America Online is a registered service mark of America Online, Inc. Other names are service marks or trademarks of their respective owners.

4025/W

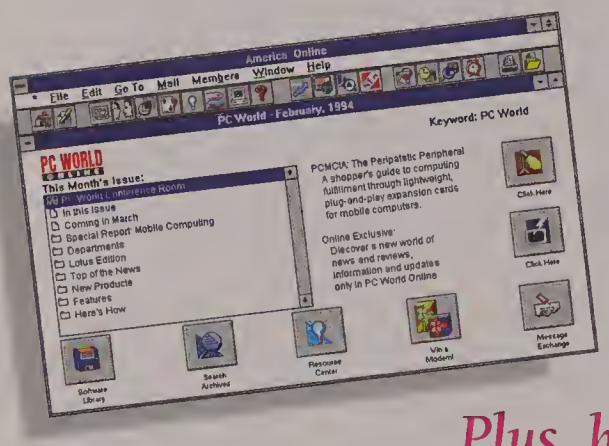
Test Drive The Internet On America Online For 10 Hours, FREE.

The Internet Center: More Content, Less Confusing.

America Online's Internet Center combines the easiest navigation with the most comprehensive collection of Internet resources of all the major online services.



- Internet e-mail with no surcharges
- Widest variety of university, corporate, and regional Newsgroups
- Over two months' worth of Newsgroup archives
- Best Gopher and WAIS sites organized for easy access
- Improved reliability due to extensive Gopher caching
- Available at 2400 baud, 9600 baud, and now over TCP/IP—all at one price
- More USENET Newsgroups than any other service—over 11,000, including all the `alt.*` groups
- All Internet Gopher and WAIS databases, and the fastest Veronica server—which is *always* available



Featuring PC WORLD Online.

In addition to the Internet, enjoy easy access to the electronic version of **PC WORLD** magazine.

- **Talk** to **PC WORLD** editors *and* meet other **PC WORLD** readers.
- **Search** back issues and find specific articles with a click of a button.
- **Download** the monthly top ten software programs selected by **PC WORLD** expert
- **Learn** about upcoming features and events before the next issue hits the newsstands

Plus, hundreds of other features on America Online, includin

- NBC Online
- Unlimited e-mail
- The New York Times Online
- Stock and mutual fund quotes
- DC Comics Online
- Over 100,000 downloadable files

Just mail the attached card or fax it to us at 1-800-827-4595. Or simply call 1-800-827-6364, Ext. 4025.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 9096 VIENNA, VA

POSTAGE WILL BE PAID BY ADDRESSEE

AMERICA Online®

8619 Westwood Center Drive
Vienna, VA 22182-9806

AMERICA Online®

PC WORLD ONLINE

Step into the Future with Everex STEP™ Note

Built-In Upgradability

Four steps to the perfect portable:
Step 1 - upgrade the CPU from 486SX-33 through IDX2-50 to Intel DX4-75
Step 2 - upgrade the display from mono STN through color DSTN to TFT
Step 3 - upgrade the removable hard disk from 120MB through 250MB and 340MB to 514MB
Step 4 - expand your options with fax/modem, Ethernet, SCSI and other PCMCIA cards

Road Ready Multimedia

Integrated digital audio chip set and sound generator lets you record, compress and play back. The Everex STEP Note includes built-in speaker and microphone, plus a jack for external ones.

Reliability & Service

The Everex STEP Note carries on the Everex tradition of reliability. We also include a 2 year warranty for additional peace of mind.

486SX mono starts at $1,495.
486SX color starts at $1,995.
Intel DX4-75 TFT starts at $3,495.

intel inside

5020 Brandin Court
Fremont, California 94538
Fax (510) 683-2186

Call **1-800-EVEREX4** (1-800-383-7394) for the location of the dealer nearest you.

EVEREX
EVER for EXcellence®

MICROSOFT® WINDOWS™ NT.

energy ALLY

2 YEAR WARRANTY

The Intel Inside logo is a registered trademark of Intel Corporation. All other trademarks used herein are the property of their respective owners.

Circle 107 on reader service card

character indicates that the file is compressed. To decompress it, you must use the EXPAND utility that comes with Windows. Exit to DOS and type a command like **C:\WINDOWS\EXPAND A:\SSERIFE.FO_ C:\WINDOWS\SYSTEM\SSERIFE.FON** (substituting your drive and path information).

Reload Windows, start Control Panel, open the Fonts option, select *Add*, and specify Windows' SYSTEM subdirectory if necessary. Then select *MS Sans Serif 8,10,12,14,18,24 (VGA res)*, or a similar entry ending with '(8514 res)' for the super-VGA version. Click *OK*, close Control Panel, and restart Windows.

For a snazzier desktop, replace the default font with a TrueType or PostScript font. Here's how: Select *File•Run* in either Program Manager or File Manager, type **WIN.INI**, and press **<Enter>**. Then, under the [Desktop] heading in your WIN.INI file, type **IconTitleFaceName=Arial**. If you don't want Arial, substitute a different TrueType or PostScript font, spelling the name as it appears in the Font dialog box of Windows Write (select *Character•Fonts*). But you can't choose WingDings or use a plotter font such as Modern, Roman, or Script.

Cut Review Writing Time In Half.

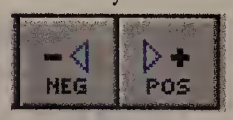
Introducing New Employee Appraiser 2.0.™

Here's a guaranteed better way to give employees the feedback they deserve. New Employee Appraiser 2.0, for Windows.

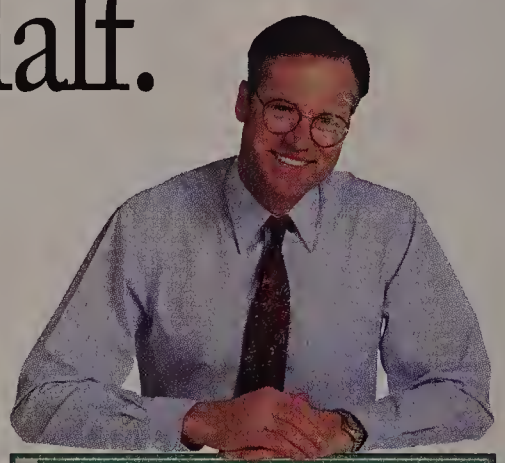
Employee Appraiser 2.0 is the first software created with the knowledge of managers, HR professionals, business professors and labor law experts built right in. Its proven headstart method gives you more than 600 professionally written paragraphs to use in your own review documents and a Language Scan Glossary to weed out inappropriate language. But that's not all.

FEATURES:
- Over 600 real-world examples from actual evaluations.
- Word-scanning glossary checks for inappropriate language.
- 100,000-entry spelling checker.
- Managers section helps you prepare for review meetings.
- Pop-up Coaching and Motivation Advisor helps get the most out of employees.
- Full-featured word processor built in.

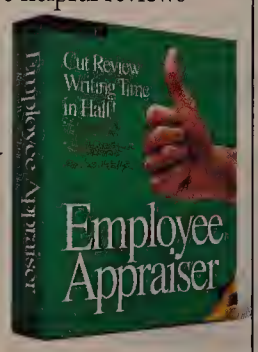
New in version 2.0, we've added a Coaching Advisor to help correct everyday performance issues and a Writing Tuner™ that changes the tone of entire paragraphs automatically. With so many new and useful features, it does more than cut your review writing time in half, it actually helps you develop your employees. No wonder it's the #1-selling management development tool in the world.



Rewrite entire paragraphs to match the tone you want. Just press one of the VCR-like buttons to dial it up or down.



Don't your employees deserve better feedback? Wouldn't you feel better giving it to them? Employee Appraiser for Windows. Clearer, more helpful reviews in half the time. Guaranteed.



Only $99!* Order Now! 60-Day Money Back Guarantee!

1-800-809-9920
Ask for Priority Code PCW3

AUSTIN•HAYNE™

Austin-Hayne Corp., 3 Lagoon Drive, Suite 340, Redwood City, CA 94065 415/610-6800 Fax: 415/610-6810
© 1994 Austin-Hayne Corporation. Employee Appraiser is a trademark of Austin-Hayne Corporation. All other trademarks are the property of their respective companies. *Shipping & Handling $7.50. International shipping will be extra.

Circle 41 on reader service card

Cleaning Up Control Panel

Q I recently removed a Windows program I didn't like from my system, but I can't delete the icon it placed in Control Panel. How can I drive out this unwanted icon?
Michael Ferry, PC World Online

A To delete a Control Panel icon, you must identify and remove the related CPL file from Windows' SYSTEM directory.

First, check the deleted application's manual—it may list the CPL file it installs. If it doesn't, ask the program's vendor. If the company isn't helpful, pop the program's installation disks into a floppy drive and look for files ending in CPL or CP_. If this doesn't help, slip on your deerstalker, run File Manager, and start snooping for CPL files in Windows' SYSTEM subdirectory. The CPL file you want to eliminate probably has a file name similar to that of the program you deleted. (*Don't* delete MAIN-.CPL, CPWIN386.CPL, DRIVERS.CPL, or SND.CPL; they come with Windows.)

If the names baffle you, compare the dates and times of the files on the installation disks with those of the CPL files on your hard drive. If there's a match, you've probably found the culprit. While you're at it, look in the WINDOWS and SYSTEM subdirectories for DLL, HLP, INI, and other files that have names similar to that of the suspect CPL file. Then move these files to a temporary directory not listed in the PATH statement of your AUTOEXEC.BAT file. Start Control Panel; if the icon is gone and its name has been removed from the Settings menu, you've succeeded and can now delete the relocated CPL file. Before you delete the other moved files, wait a few days to make sure that they're not used by other programs.

By Scott Dunn

Scott Dunn is a contributing editor for PC World *and coauthor of* 101 Windows Tips *(Peachpit Press, Berkeley, California, 1992).* Windows Q&A *welcomes your questions (see page 10 for contact information).*

© 1994 Iomega Corporation. Iomega and the Iomega logo are registered trademarks and Tape250 is a trademark of Iomega Corporation.

JUST A FRIENDLY REMINDER.
OUR TAPE DRIVES ARE THE SIMPLE WAY TO BACK UP.

You've just done some important stuff on your PC. And you'd prefer not to lose it. Well, an Iomega tape drive is the easy way to set your mind at ease.

It makes backing up your files nearly effortless. You can back up individual files~for easy retrieval. Or your whole hard disk. Iomega's backup software lets you decide. Plus, it lets you back up without leaving your operating environment~be it Windows, OS/2 or DOS.

And for the performance-minded, Iomega's tape drives are up to 60% quieter and use 25% less power than other drives. They're also built so well that Iomega confidently backs them up with the only 5-year warranty in the business.

Iomega tape drives. Easy to install. Easy to use. And easy to buy. Just call Iomega at 1-800-289-4034 for the computer dealer nearest you. In fact, call right now so you don't forget.

IOMEGA®

Circle 152 on reader service card

ONLY

MOTHER

NATURE

PACKS

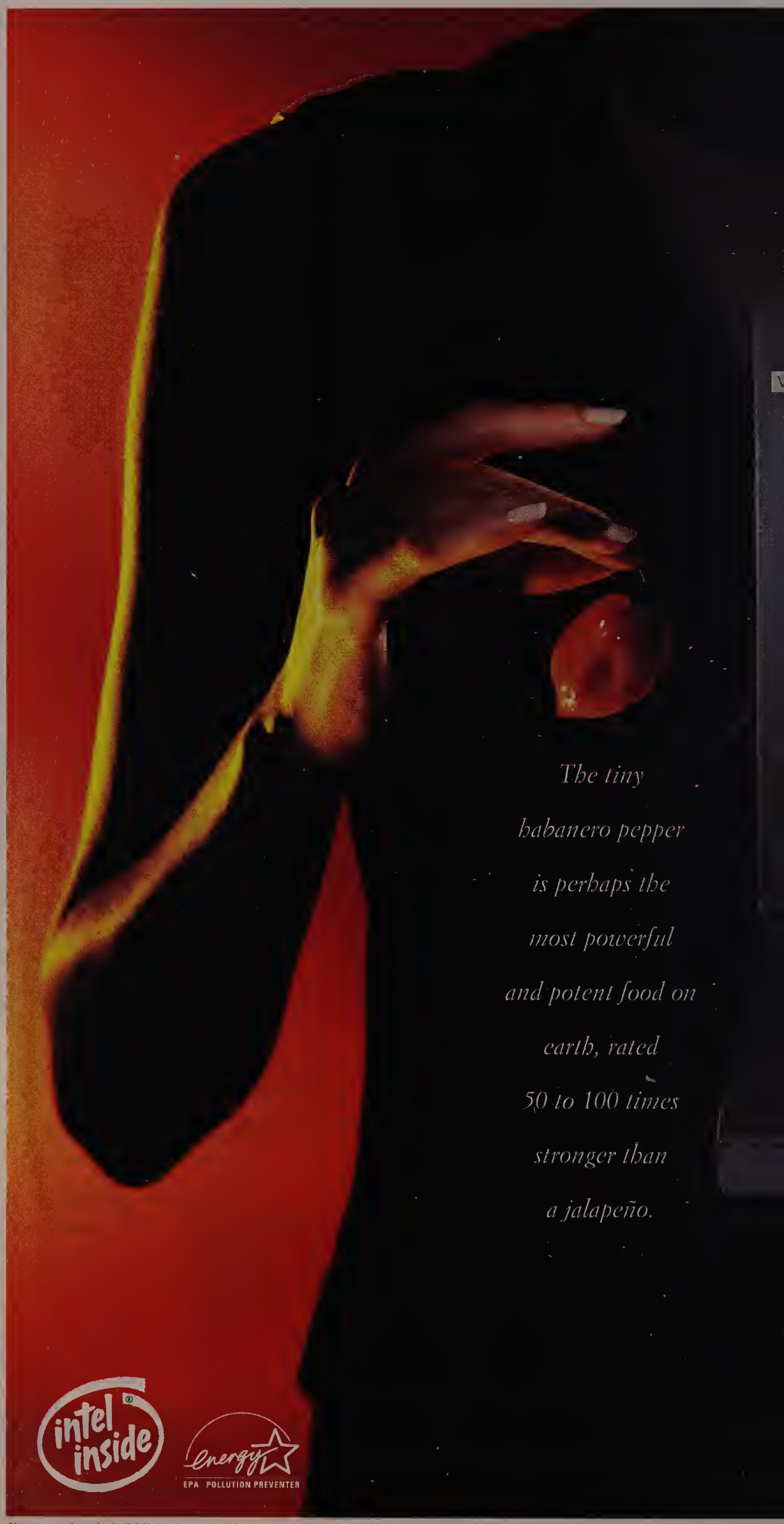
MORE

POWER

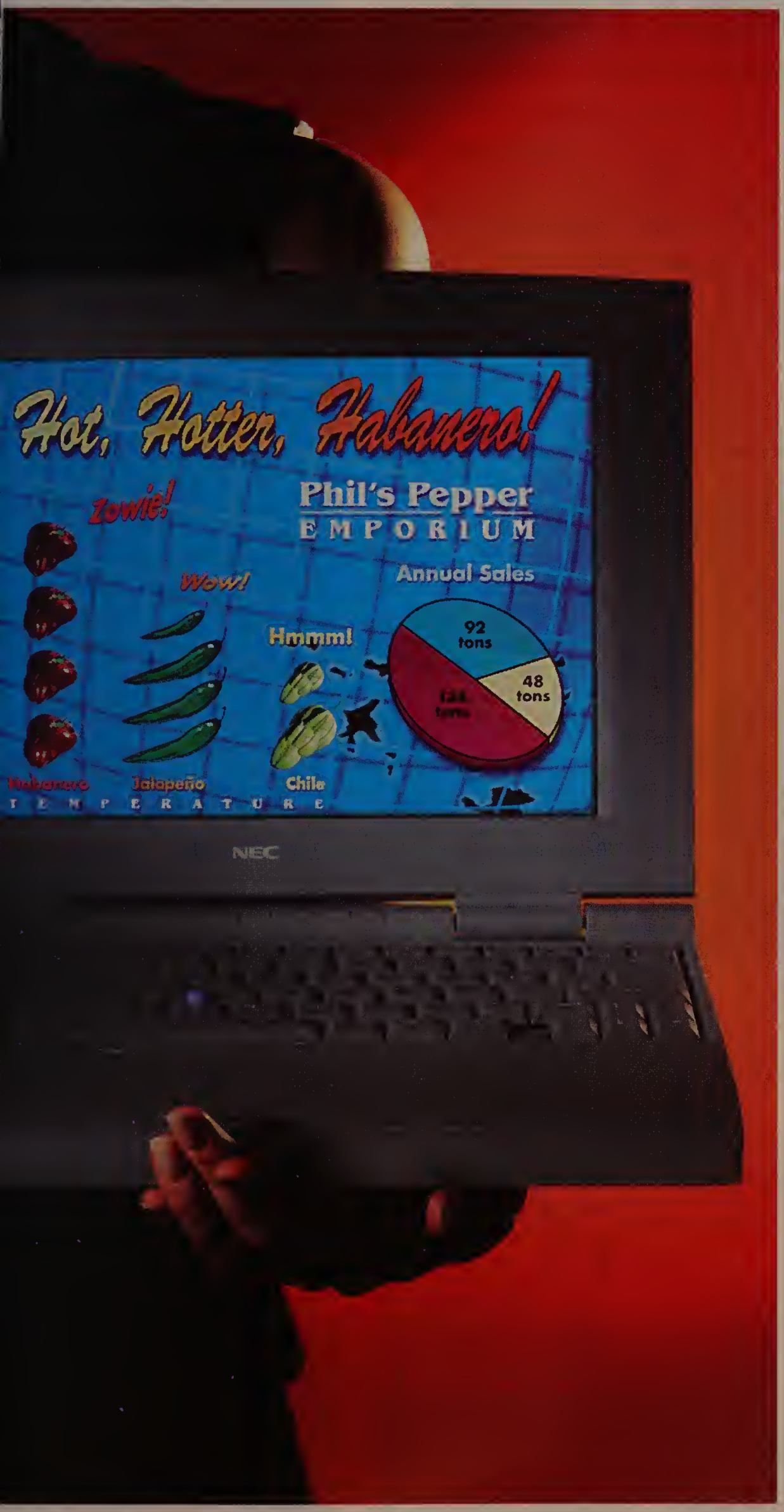
INTO SUCH

A SMALL

PACKAGE.



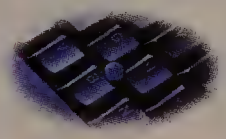
*Versa is a trademark of NEC Technologies, Inc. The Intel Inside logo is a registered trademark of Intel Corp. All other trademarks are the property of their respective owners. The Energy Star emblem does not represent EPA endorsement of any product or service. * Versa S monochrome model © 1994 NEC Technologies, Inc. NEC GSA #GSOOK91AGS5241*



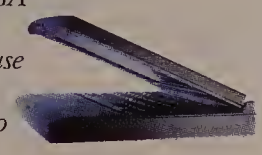
Here's a hot little number guaranteed to set your imagination on fire. Presenting the Versa™ S notebook computer from NEC.

VERSA = VERSATILITY

Perhaps the most powerful notebook pound–for–pound (actually, starting at about 4 lbs.) on earth, thanks to the availability of an i486™ DX2/50 processor with on–board local bus video, up to 12 MB RAM and 260 MB hard disk storage. The Versa S is, in dimension, no larger than a piece of notebook paper. But that didn't stop us from packing it with an unusually long list of standard features. Choose from a brilliant 9.5" color TFT, enhanced color DSTN or monochrome*



LCD display. It features a large keyboard with an accurate SurePoint™ pointing device, PCMCIA Type III capabilities, serial, parallel, SVGA and keyboard/mouse



ports. Yet, it folds to a svelte 1.4 inches. For more information, call 1-800-NEC-VERSA or visit an authorized dealer. The Versa S notebook. It's got the kind of powerful kick that would impress even Mother Nature.*

SEE, HEAR AND FEEL THE DIFFERENCE.

NEC

Circle 187 on reader service card

DATA MANAGEMENT Q&A

Time-Stamping Paradox Records

Q We use Paradox 4.5 for Windows to track customer service calls. I'd like Paradox to time-stamp each call automatically, entering the date into a date field and the time into an alphanumeric field. How can I have the program do this? Right now, we have to enter this information manually.
Sam Kline, Chicago

A You can add a *method* to your data entry form that will fill in the date and time whenever a new record is inserted, and then move the cursor to the next field waiting to be filled in.

The first thing you'll need is a data entry form. If you don't have one, you can create one quickly by bringing up your table and pressing **<F7>**. With your form open, press **<F8>** or click the *Design* icon to enter Design mode. Right-click the form's title bar, and select *Methods* from the resulting pop-up menu. Then double-click *action* under Built-in Methods.

A window will appear for entering your method's code. Some code will be in the window already—all you have to do is add a few lines to make it look like **FIGURE 1**. I'm assuming that your date and time fields are called Date and Time, and that the field you want the cursor to jump to is called First Name. Of course, you'll change these field names to match the names that appear in your own table.

After you add the lines, select *Language•Check Syntax* or click the *Check* *Syntax* icon to make sure your code is correct. When you are satisfied, close the window and press **<F8>** or click the *View Data* icon to leave Design mode.

To test your new method, press **<F9>** or click the *Edit Data* icon while in the form, then press **<Insert>** to add a new record (<Page Down> will not work in this case). Paradox will automatically fill in the time and date and put the cursor in the First Name field. Be sure to save the form when you close it. Remember to use this form when you enter data so that Paradox will stamp your time and date fields automatically.

One caveat: For your form to work right, the time field must be long enough to hold the time text as it's formatted by Windows—by default, that's 10 characters. To change the time format, open Control Panel and double-click the *International* option.

```
method action(var eventInfo ActionEvent)
if eventInfo.isPreFilter()
  then
    ; This code executes for each object on the form.

  else
    ; This code executes only for the form.
    if eventInfo.id() = DataInsertRecord then
      doDefault
      date = today()
      time = time()
      moveTo("First Name")

    endif

endif

endmethod
```

FIGURE 1: TIME-STAMP PARADOX FOR WINDOWS records using this method.

Cream-of-the-Crop Queries in Access 2.0

Q I recently upgraded to Access 2.0 and discovered I could query for the top records in a single table. But what about more complicated queries? I want to see who my top 10 customers are in terms of sales volume, but the information is scattered across three tables: Customers, Orders, and Order Details. The Customers table is linked to Orders via the Customer ID field, and Orders is linked to Order Details by way of Order ID. To make things even more complicated, we also need to calculate sales amounts from fields called Unit Price and Quantity, both of which are in Order Details. Can you tell me how to set up this query?
John Bailey, New York

A First, open a new query (bypassing the Query Wizard) and add the three tables you mentioned to the design. Drag the customer name field into the first column of the query grid. Then click the Field row in the second column and enter **[Unit Price] * [Quantity]** (other readers can use their own equivalent field names). These steps tell Access to show two columns in the query result: your customer names and the extended price of each line item.

Next, you must tell Access to show only the total sales for each customer. Click the *Totals* icon; the expression 'Group By' will appear in the Total row of each query column. Click the Total line for the '[Unit Price] * [Quantity]' column, and select *Sum* from the drop-down menu. Then click the Sort line in the same column and set it to *Descending*.

The last step limits the query result to the top 10 records: Right-click some empty space on the query design window, select *Properties* from the resulting pop-up menu, enter **10** for Top Values, and close the Query Properties window. When you run the query, you should see just the names and total sales for your top 10 customers. (If you do get more than 10 records, it's only because there's a tie for 10th place.)

Putting Names in Proper Case With Paradox for DOS

Q We use Paradox for DOS to keep a list of people who respond to our ads. How can I make sure all the names are entered in the proper case, with the first letter of each name capitalized?
Donna Green, Milwaukee

COREL DRAW!™ 5

The Best in Graphics and Publishing

Includes

- CorelDRAW 5
- Corel VENTURA 5
- Corel PHOTO-PAINT 5
- CorelCHART 5
- CorelMOVE 5
- CorelSHOW 5

New Highlights

- Integrated user interface
- Powerful color management
- OLE 2 "drag & drop"
- Amazing morphing effects
- Spectacular gains in speed & performance
- Internal PostScript interpreter
- Standard font downloading; PANOSE font substitution
- Hundreds of enhancements in PHOTO-PAINT: masking, floating objects, mesh warp & plug-in filters
- 90 chart types; 250 spreadsheet functions
- Live dimensioning, advanced 3D & precision features

plus

- 825 fonts
- 22,000 clipart images & symbols
- 100 high-resolution photos
- CorelTRACE 5, Corel MOSAIC 5, ARES Font Minder™, Adobe Acrobat Reader™, CorelQUERY, Corel CAPTURE, Zandar TagWrite™

THREE CD-ROMs INCLUDED

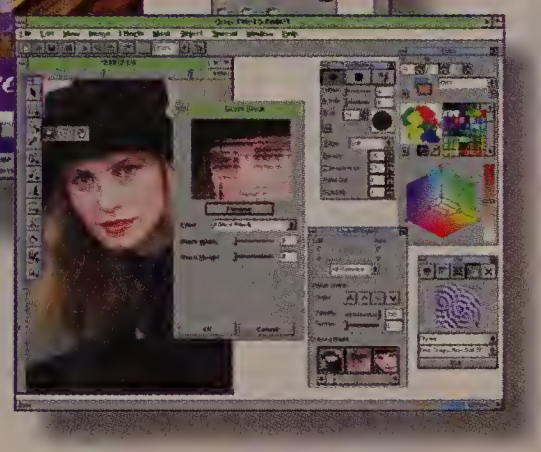
CorelDRAW 5 combines the graphics power of CorelDRAW and the advanced publishing capabilities of Corel VENTURA 5 within an integrated user interface. With a revolutionary new color management system, major performance gains and hundreds of improvements, CorelDRAW 5 retains the ease of use for which Corel is renowned. From short design-intensive documents to long text-intensive publications, CorelDRAW 5 provides the ideal tool for illustration, publishing, photo-editing, presentations, charting and animation.

Complete with six fully-featured applications and a host of useful utilities, including an internal PostScript interpreter, CorelDRAW 5 is the most exciting value-packed graphics and publishing software available!

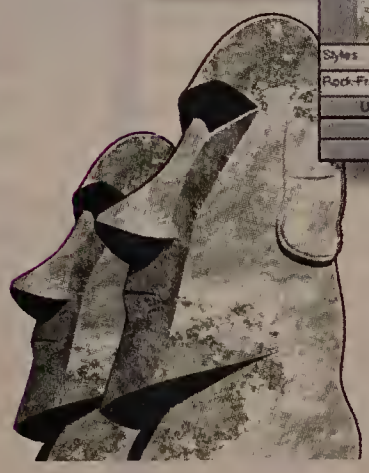
▼ PowerClip bitmaps

▶ Lens effects such as Transparency and Tinted Grayscale

▶ Paste vector art inside using PowerClip



▲ Enhanced PHOTO-PAINT with amazing special effects and support for industry standard plug-ins



◀ Exciting new textures

$469 US Funds
CD-ROM Version

4 to 5 UPGRADE
$185 US Funds
CD-ROM Version

CORPORATE SOFTWARE

800-677-4003

COREL®
613-728-3733 ext.23

KLR-0054

Circle 48 on reader service card

A By adding validity checks to fields, you can control how data is formatted as it's entered. To put names in the proper case, view your data file and press **<F9>** to go into Edit mode. Then select *ValCheck•Define*, move the cursor to the name field, and press **<Enter>**. Select *Picture* from the resulting menu.

At the Picture prompt, you have to decide exactly how much control you want over the field. To automatically capitalize the first letter and allow both uppercase and lowercase letters after that, enter ***{!*?}** at the prompt. That means that someone can still enter a name like *Mary Ann* incorrectly, forgetting to capitalize the *A*.

You can close this loophole by using the ***{!*?[ ]** picture clause instead (note the space between '[' and ']'). This entry will capitalize the first letter following a space, guaranteeing a capital *M* and *A* in *Mary Ann*. Unfortunately, it also makes it impossible to enter names like *Charles de Gaulle* correctly. There's just no way in Paradox to guarantee that a letter will be lowercase. Pick the option that seems best to you.

After you enter your picture clause, press **<Enter>** to return to your data. Now, whenever you enter names, Paradox will convert the first letter—of either the field or each word—to uppercase.

Hot-Key dBASE Directory Changes

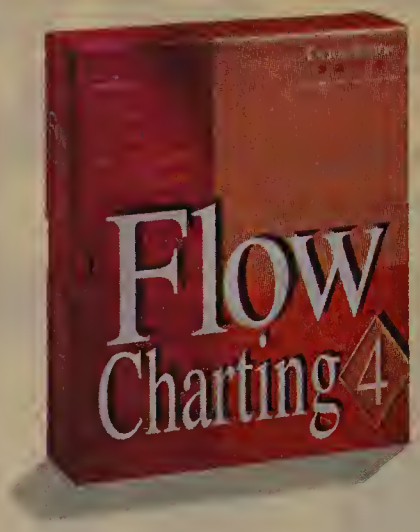
Q I use dBASE IV for several projects and keep each in its own subdirectory. So I often have to switch directories, and a few macros would make all this transmigration easier. I've recorded several macros that use the Tools•DOS utilities•DOS•Set default drive command to go to specific directories, but the macros occasionally land me in an unexpected menu or at a strange prompt. How can I make the macros foolproof?
Dan Byrd, Galveston, Texas

A The problem with macros is, they record your keystrokes, not your intentions. If you try using a macro from a different menu than the one in which you recorded it, who knows where you'll end up? Or if you're at the right menu but in a directory with a shorter name than the one you're going to, the macro's keystrokes may not completely overwrite the current directory name.

You can avoid these predicaments by recording a macro that doesn't use the menus. Select *Tools•Macros•Begin recording* and a function key to start recording your macro. Once you're recording, press **<Esc>**, then type **y** at the resulting dialog box. This brings you to the dot prompt. Next, enter **set directory to** *c:\dirname*, where *c:\dirname* is the full path of the directory you want to switch to, then press **<Enter>**. When the dot prompt reappears, type **assist** and press **<Enter>** again. This will return you to the Control Center, where you can press **<Shift>-<F10>** to end recording. If you use this technique, your macros should always work, regardless of the current working directory.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and the author of* The Paradox 4.0 Handbook *(Bantam Computer Books, New York, 1992).* Data Management *welcomes your questions (see page 10 for contact information).*

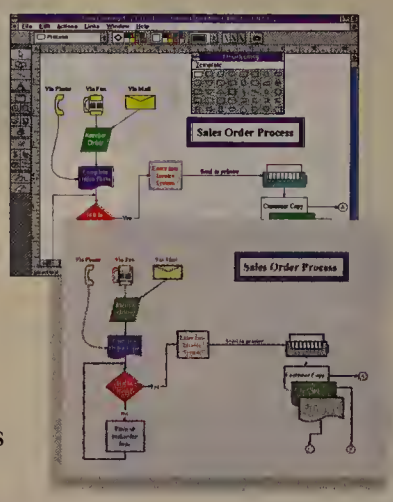


Flowcharts Any Way You Want!

Introducing Flow Charting™ 4 for Windows!

We've re-worked the basics to make flowcharting easier and more flexible than ever. We call it *sensible* technology. The end result is a flowcharting program that is incredibly powerful, yet remarkably quick to learn and use. And it's packed with everything flowcharters want. Here's a sampling:

- SensibleLines™ are totally editable. You've never experienced anything like it. Experiment with the look of your charts!
- Get your point across thanks to distortion-free shape sizing with SensibleShapes™.
- SensibleText™— Word processing masterfully designed for flowcharts — it works the way you expect!
- Job-specific shape templates let you create the perfect chart for the task at hand.
- Snapshot™ your preferences. Your charts look great every time.



And Flow Charting 4 is backed with a 90-day no-risk guarantee. Our legendary post-buy support includes free unlimited technical support, free subscription to The Flow Charter™ and access to valuable flowcharting resources.

For flowcharts *exactly* the way you want, you need Flow Charting 4 for Windows! See your local dealer today, or for a free interactive demo, call now:

(800) 525-0082 ext. 254
International: (408) 778-6557

PATTON&PATTON
Excellence in charting the flow of ideas!

Patton & Patton Software Corporation 485 Cochrane Circle, Morgan Hill, CA 95037
All company and product names are trademarks or registered trademarks of their respective owners.

Circle 233 on reader service card

Success, Power and Creativity. It's Your Image.

Make it a reality with a ViewSonic monitor. And, since 17" monitors (15.7" viewable diagonal) are the size of choice by most professionals, we offer one for every budget and application. Take pride in knowing the image on your screen is bright, crisp and picture-perfect. Don't settle for less.

In addition to edge-to-edge focus, compatible with resolutions up to 1600 x 1280, and vertical refresh rates as high as 160Hz, our **NEW** ViewSonic 17 and 17G monitors feature OnView. This control system allows you to adjust the image via the on-screen menu, including color matching. Compare specs, price and performance – you'll See The Difference!

During the past year, our monitors have received 16 awards from major computer publications. Plus, ViewSonic was named in *Inc.* magazine's 1992 and 1993 top 500 fastest growing companies. In keeping with our commitment for environmental and energy conservation, these monitors surpass the strict Swedish MPR-II standards for low radiation and support the EPA's Energy Star program.

ViewSonic monitors . . . designed with your image in mind.

PC and MAC compatible.

Screen Size*	ViewSonic 17 17"	ViewSonic 17G 17"	ViewSonic 17E 17"
Dot Pitch	0.27mm	0.28mm	0.28mm
Maximum Resolution	1600 x 1280	1280 x 1024	1280 x 1024
Maximum Refresh	160Hz	160Hz	90Hz
Horizontal Frequency	30-82KHz	30-64KHz	30-64KHz
ViewMatch™ Color Control	Yes	Yes	Yes**
OnView™ Controls	Yes	Yes	No
Flat Square Screen	Yes	Yes	Yes
MSRP	$1,045	$945	$865

* Diagonal viewable screen areas of 17" monitors from 15.5" to 15.7".
** Color temperature switching from 6550°K to 9300°K.

ViewSonic®
See The Difference!™

Tel: (800) 888-8583 or (909) 869-7976 Fax: (909) 869-7958
Call FaxSonic at (909) 869-7958 (fax-on-demand)
Request Doc. 147 (17E), 148 (17G), 152 (17)
Applelink: VIEWSONIC Compuserve: 73374, 514

All products and trademarks are brand names of their respective companies.
CAD image courtesy of Engineering Design Automation
3D image courtesy of Spatial Technology Inc.

Circle 218 on reader service card

New!
REACHOUT Pr
4.0 for Windows!

LAN MAGAZINE
1994 PRODUCTS OF THE YEAR

Rated Number One In The Field

If you work away from the office, or need to provide remote support, get the product that's ideal in the field. ReachOut Remote Control. It supplies the power to remotely control any PC running Windows or DOS. From anywhere. To anywhere. View a remote PC's screen in one Window while working locally in another Window. Use ReachOut's exclusive Remote Clipboard to cut and paste data between the two. Transfer files at record breaking speeds. Even synchronized files between two PCs.

INFO WORLD

ReachOut has earned three major awards in the past 18 months. The latest being "Product of the Year" for 1994 from LAN Magazine. Which goes to show that ReachOut is one powerful networking tool. InfoWorld proclaimed "ReachOut offers superb screen, mouse, and file transfer speeds and provides as many security options as Sing-Sing. Operation is as smooth as silk." InfoWorld rated ReachOut as #1 and awarded it their Buyer's Assurance Seal. And PC Magazine UK confessed ReachOut "was the only remote control program that worked right out of the box." They named ReachOut The Editor's Choice and called it a top notch value. The new ReachOut Version 4.0 for Windows continues the tradition of excellence with support for all high resolution monitors up to 1280 by 1280 with 256 colors. What's more, it makes no modifications to the Windows initialization files. And speed is as much as 40% faster than the version InfoWorld had reviewed.

PC MAGAZINE UK EDITORS' CHOICE

So don't settle for anything less than ReachOut. Call us toll free now for more information or for the ReachOut dealer nearest you. 1-800-677-6232. And then be the best in your field, with the best in the field.

1-800-677-6232

Ocean Isle

1201 19th Place
Vero Beach, Florida 32960 U.S.A.
Phone (407) 770-4777 Fax (407) 770-4779

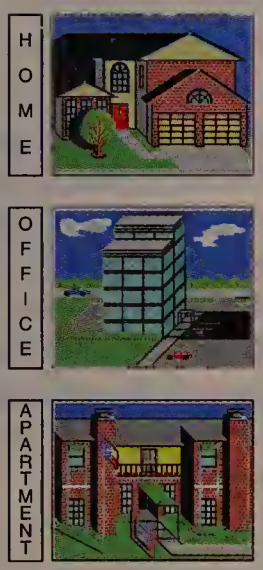
Circle 164 on reader service card

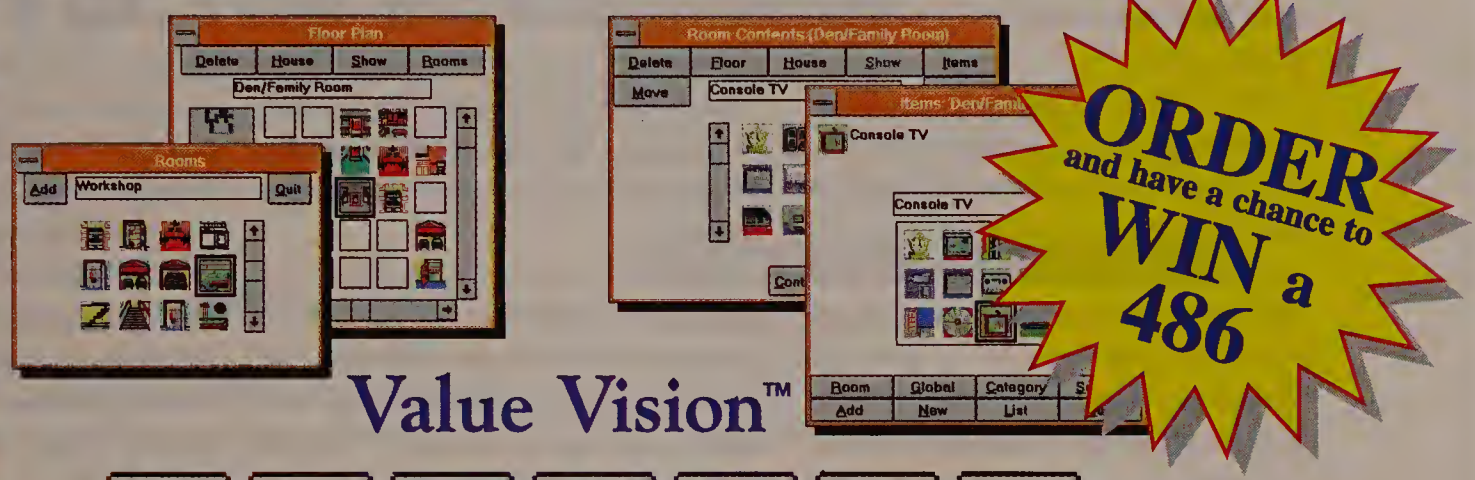
FREE*

~~$99.99~~

Personal Inventory Manager™

The response to our offer has been overwhelming. Many of you have had difficulty obtaining a copy, so we are extending our offer. We would like to say thank you by giving away a 486 computer each month this offer remains in effect, to someone who has ordered **Value Vision**. (**ALL** orders received to date have been entered in the drawing.)





Value Vision™

Will you know what you had when it's gone?
Could you prove it?

Finally, Personal Inventory Software That Is Quick, Easy, And Fun.

Armed only with a mouse and Fusion Software's **Value Vision**, you can capture the contents of your home or office, and it's quick, easy, and fun. Now you can have the peace of mind you've always wanted, knowing that you are properly insured. And filing an insurance claim with **Value Vision** is as easy as clicking a mouse button.

What used to be a boring, tedious, text operation with a database, word processor, or spreadsheet, is now fun, easy, and graphical with **Value Vision**. If you can drag and drop an icon, you can create a list of the contents of your home or office. It's that simple!

Value Vision does it all!

- Provides a complete record
- Contents selection, sorting, and reporting.
- Prints claim forms
- Settlement tracking

A Personal Inventory Manager That Has Expert Insurance Advice.

Over 600 colorful icons to help you identify rooms and items in your home or office. You may enter as little or as much information about each item as desired. You can even assign an heir. **Value Vision** will help you by highlighting insurance company requirements.

To prove how important we think your records are we are giving away thousands of copies. But you have to act fast. Order your FREE* version of our $99.99 Value Vision now.

486

All orders received will be eligible for our monthly drawing for a free 486 computer system. So order now and we will enter your name in the 486 drawing.

ORDER TODAY!

Call: **800-856-8566**
713-465-6363 (Houston)
713-465-9749 (fax)

Mail: **Fusion Software**
9337-B Katy Frwy, Ste 444
Houston, TX 77024
TX residents add 8.25% sales tax

P9

MICROSOFT® WINDOWS™ COMPATIBLE

***There is a $9.95 nonrefundable shipping and handling charge.** Have your Mastercard or Visa ready. One copy per household. This offer only available in the U.S. and Canada. IBM PC or compatible running Windows 3.1, VGA or better, mouse or compatible device, and minimum 2MB ram required. This offer is subject to availability. Fusion Software reserves the right to end this offer at any time. Offer void where prohibited by law. © Fusion Software,Inc., Houston, TX 77024. Personal Inventory Manager and Value Vision is a trademark of Fusion Software. Windows is a trademark of Microsoft® Corporation.

Fusion Software

Circle 111 on reader service card

PUBLISHING & PRESENTATIONS MAKEOVER

Ten Seconds Till Impact

A one-page flier is an excellent way to advertise your wares to potential customers, but its average life span is shorter than a mosquito's. You have to grab the reader's attention immediately before your document is flicked into the circular file. But you can convey a lot of information quickly—if you make it easy to find.

This month's makeover candidate comes from Michael Stearns, a tax attorney in Houston. Stearns used WordPerfect 5.2 to create a flier to attract lawyers and CPAs to his tax seminars. Unfortunately, the flier never really gets off the ground, in part because the essential information (What's the seminar about? Who should attend? When and where is it?) is buried.

To show you how Stearns can make his flier more effective, we imported the document into PageMaker 5.0 and set about redesigning it. Our goal: to make the information more accessible by reorganizing the page.

A Change of Face

The first thing we did was change typefaces. The original layout contains mostly 10-point Courier, with one odd detour into Times Roman. We switched to Helvetica (TrueType fans could use Arial instead) for a cleaner, more professional look. We also cranked up the body text size to 12 points for greater readability.

Next, we turned to the headline, your first and last opportunity to snag readers and thus the most important piece of text. The original head is small and high on the page, making it too easy for readers to miss. We opted for a larger, newspaper-style head on two lines, leaving no doubt what the seminar is about and who should be there.

Before

TAX PROCEDURE - For the Practitioner

6 Hours CPE for C.P.A.s & Enrolled Agents; 3.25 for Attorneys

This seminar covers selected practical and procedural rules and techniques for assisting taxpayers from the time a deficiency is proposed through settlement and/or collection. This seminar is intermediate level with no advance preparation. Attorneys will qualify for MCLE for the College of the State Bar of Texas and Texas Board of Legal Specialization in Tax Law.

*Avoiding and Abating Penalties

*Bankruptcy & Tax Collections

*Collection from non-liable spouse in community property states

*Tax Deficiencies
-Statutory notices
-Recision of deficiency notices
-Assessments
-Settlement forms & consequences
-Statute of limitations for assessments and collections

*Offers in Compromise

REGISTRATION INFORMATION

LOCATIONS AND DATES

GALVESTON	COLLEGE STATION	HOUSTON
Oct. 22, 1992	Oct. 9, 1993	Oct. 29, 1993
Holiday Inn	College Station Hilton	J.W. Marriot
5002 Seawall Blvd.	801 University Dr. E.	5150 Westheimer

TIME 8:30 a.m. - 12:10 p.m. Registration begins at 8:00 a.m.

REGISTRATION DEADLINE 5 days prior to each seminar. Remit a $10 late fee after that date. Registration will be accepted at the door subject to space availability and a $10 additional registration fee.

COURSE FEE $55.00

SEMINAR BOOK 60 page seminar book included

CANCELLATION Must receive written notice postmarked no later than the day prior to the seminar, $10 cancellation fee

REFRESHMENT Complimentary coffee, tea, and soft drinks

NO CONFIRMATIONS MAILED

THE SPONSOR RESERVES THE RIGHT TO LIMIT ATTENDANCE OR CANCEL WITH REFUND

SEMINAR SPEAKER Michael Stearns, J.D., C.P.A., Board Certified in Tax Law, Texas Board of Legal Specialization, 12 years tax law practice, 4 years prior tax practice with national C.P.A. firms, Adjunct Professor, University of Houston - Clear Lake

Multiply and Divide

Our next step was to break up the page by splitting it into two columns. The reason is simple: It's easier to skim down a narrow column than across a wide one, especially when you're dealing with short blocks of information.

In the left column we collected information about what's going to happen at the seminar—the topics, speaker, and so on—in four sections. Each section has its own subhead, set in Helvetica Bold. And we set off Stearns's bio by surrounding it with a box.

We then put all the logistical details in the right-hand column. We split this information into two sections, each set off by a subhead in reverse type (white type on a black background).

Happy Landings

To liven up the document without detracting from its professional tone, we added 4-point rules at the top and bottom to frame the text and balance the page. We also added a thin vertical rule between the two columns to define where they begin and end. Finally, we replaced the asterisks in the bulleted list with checkmarks from the Zapf Dingbats collection (you could also use TrueType Wingdings).

Granted, a flier advertising a seminar on tax procedures is never going to set readers' hearts aflutter with excitement. But you can apply the techniques outlined here to virtually any short, data-intensive document, using design elements to organize the page and make the information more accessible. And if you do your job well, your flier may skip the circular file entirely—and land safely on your customer's bulletin board.

By Art Weller and Daniel Tynan

Art Weller, a designer based in Oakland, California, performed the document redesign. Daniel Tynan is a contributing editor for PC World. Publishing & Presentations *welcomes your questions and makeover candidates (see page 10 for contact information).*

After

4 Hours CPE for C.P.A.s & Enrolled Agents; 3.25 for Attorneys

Tax Procedure For The Practitioner

This seminar covers selected practical and procedural rules and techniques for assisting from the time a deficiency is proposed through settlement and/or collection. This intermediate level with no advance preparation. Attorneys will qualify for MCLE for of the State Bar of Texas and Texas Board of Legal Specialization in Tax Law.

Topics

g and Abating Penalties

ptcy & Tax Collections

- ✔ Collection from non-liable spouse in community property states
- ✔ Tax Deficiencies
  - – Statutory notices
  - – Recision of deficiency notices
  - – Assessments
  - – Settlement forms & consequences
  - – Statute of limitations for assessments and collections
- ✔ Offers in Compromise

Seminar Book

dee will receive a 60 page mpanion volume.

nts

ntary coffee, tea and soft drinks ilable during the seminar.

Seminar Speaker

Michael Stearns, J.D., C.P.A., is Board Certified in Tax Law, Texas Board of Legal Specialization. His background includes twelve years in tax law practice and four years prior tax practice with national C.P.A. firms. He is an Adjunct Professor at the University of Houston-Clear Lake.

Where & When

College Station
Oct. 9, 1993
College Station Hilton
801 University Drive E.

Galveston
Oct. 22, 1993
Holiday Inn
5002 Seawall Blvd.

Houston
Oct. 29, 1993
J.W. Marriott
5150 Westheimer

Important Information

Time
8:30 a.m. — 12:10 p.m.
Registration begins at 8:00 a.m.

Fee
$55.00

Deadline
Payment must be received 5 days prior to each seminar. Remit a $10 late fee after that date. Registration will be accepted at the door subject to space availability and a $10 additional registration fee.

Cancellation
Must receive written notice postmarked no later than the day prior to the seminar. There will be a $10 cancellation fee.

No confirmations mailed • The sponsor reserves the right to limit attendance or cancel with refund

1 The big headline leaves no doubt what this flier's about. With larger type sizes (like this 36-point Helvetica Black), reduce the amount of space between letters slightly so they don't look too spread out (use your program's kerning utility).

2 Splitting the information into two columns makes it easier to skim. A thin vertical rule separates the columns and guides the eye down the page.

3 Putting the speaker's bio inside a box makes it stand out, while using full sentences gives the information a friendlier, more informal tone.

4 Judicious use of boldface and reverse type draws the reader's eye to the important information—like the location, time, and cost of each seminar.

5 Thick rules at the top and bottom help balance other visual elements on the page. Using a smaller, bold italic font makes this text at the bottom noticeable but not obtrusive.

COMMUNICATIONS Q&A

Researching Prospective Employers Online

Q A headhunter set up a job interview for me with an out-of-town employer. I don't know much about the company except that it's medium-size and has been in business less than ten years. Do you know of any online service or database where I can find more information about the company?
Andrew McGee, Fort Worth, Texas

A The best place to search is CompuServe's collection of company information databases. At any CompuServe prompt, type **GO COMPANY**, then press **<Enter>**. Where you go from the resulting menu depends on whether the company you're researching is publicly traded or privately held.

If it's a private concern, I'd start with Business Database Plus. It contains full-text articles from more than 500 business magazines, trade journals, regional business newspapers, and industry newsletters. You can find revealing bits of information, but take them with a grain of salt: Companies are rarely discussed here in anything but glowing terms. (I once found upbeat articles about a small firm, though I knew for a fact that its payroll checks had been bouncing for months.) Access to the database costs $15 per hour, plus a $1.50 charge for each article you read.

D&B Dun's Market Identifiers database has information on private and public enterprises. Enter the company name and you'll get the sales figures, net worth, number of employees, and corporate family tree of subsidiaries. Each Market Identifiers search costs $7.50 for up to five names, plus $7.50 for each full company record you read.

If the company is traded on a public exchange, you have four options on the CompuServe company menu. First, Standard & Poor Online's company reports include a one-paragraph company backgrounder plus details on revenues, long-term debt, and stock market activity; reports cost $1 per company. Second, you can check the Disclosure II database, which contains company reports and other Securities and Exchange Commission filings; the cost is $5 to $17, depending on the information you request. Third, the Company Analyzer provides company profiles, stock price histories, financial statements, projected earnings, and analysts' outlooks. Costs vary depending on the information you access. Finally, Citibank's Global Reports give you company news and history, SEC filings, earnings, products, and subsidiaries. But access is pricey: $60 an hour on weekdays, $30 at night and on weekends.

If you're concerned about your prospective employer's financial status, check the firm's credit history in the TRW Business Credit Profiles database in the same CompuServe company menu. This database contains credit histories; financial information; company profiles; details of any tax liens, judgments, and bankruptcies; plus payment histories to creditors. The search costs $9, plus $34 for each credit report.

You can find revealing bits of information on CompuServe's Business Database Plus, but take them with a grain of salt.

A note of warning: All the charges listed here are in addition to CompuServe's connect fees ($4.80 per hour for 2400-bps access, $9.60 for 9600 and 14,400 bps). Before you tap into any database, be sure you're clear on the search charges. We hear from too many readers who unwittingly rack up big online bills searching for information.

Distributing Software as Shareware

Q I've written a simple phone log utility. How do I go about distributing it as shareware? Do I need to register it with an agency? How much should I charge for the program? Do I need to offer support to people who send me money for it?
Matt Whitney, Ayr, Ontario, Canada

A According to Richard Harper, president of the Association of Shareware Professionals, the first thing you should do is get your product copyrighted. Call the Library of Congress's Registry of Copyrights (202/707-3000) and ask for Form TX and Circular 61. Registration costs $20, but it should deter anyone from stealing your code.

As for pricing, you should check similar shareware products and set your price accordingly. Then just upload your program to the appropriate forums on the major online services—such as CompuServe, America Online, and GEnie—plus a few bulletin board systems, and wait for the checks to roll in. (The rules and procedures for uploading files vary. Check with the forum's or BBS's sysop for specific guidelines.)

Should you provide support? It's a darn good idea, says Harper. "It will be hard for someone to justify sending you money if they can't expect something besides the software in return." He suggests creating a support forum on a local BBS, or providing E-mail support via CompuServe or the Internet.

Now that you're a bona fide software mogul, you might consider joining the Association of Shareware Professionals (ASP). It's kind of like the Better Business Bureau of shareware: If your product comes with a statement of ASP membership, potential buyers will be less apt to regard you as some fly-by-night hacker. To find out more about joining, contact the ASP on CompuServe by typing **GO ASPFORUM** or by calling 616/788-5131.

By Judy Heim

Judy Heim is a PC World *contributing editor and author of* The Best Guide to Business Shareware *(Osborne/McGraw-Hill, Berkeley, California, 1994).* Communications *welcomes your questions (see page 10 for contact information).*

"Wow, I Could've Had a V.34!"

Introducing the True V.34 28,800 bps Sportster® Modem from U.S. Robotics.

Before you buy any other modem, check out the new Sportster® V.34 from U.S. Robotics; the fastest, most reliable data/fax modem available today. Because the Sportster® V.34 operates at an incredible 28,800 bps, it saves you phone and on-line time charges. And because the Sportster® utilizes true ITU-T V.34 standard protocol, it's fully downward compatible with 14,400 bps and Rockwell® V.Fast Class modems.

Sportster® V.34 is more than just fast, it's twice as fast as most modems sold today. Setup is simple. It's highly intuitive. And comes complete with over $300 worth of free software, including introductory packages for on-line services and menu-driven QuickLink II DATA & FAX® software. Like its predecessors, the Sportster® V.34 is affordable, too -- just $329 suggested list price.

Call 1-800-DIAL-USR and ask about the Sportster® true V.34 today. You simply can't buy a faster modem.

The No.1 Selling Modem Sportster In The World

Sportster®

1-800-DIAL-USR

USRobotics

The Intelligent Choice in Data Communications

S. Robotics, Sportster and the USRobotics logo are registered trademarks of U.S. Robotics, Inc. QuickLink II FAX® is a registered trademark of Smith Micro Software, Inc.

Circle 154 on reader service card

HARDWARE Q&A

How Fast Is Fast Memory?

Q My PC's manual says to use memory rated at 80 nanoseconds or faster. Would I see better performance with 70ns, 60ns, 53ns, or even 40ns memory?
Aaron Loo, Pleasanton, California

A In a word, no. Memory speed ratings don't describe how *fast* memory is: They specify the top speed at which the memory can be accessed safely by a system. Memory rated at, say, 60ns can tolerate access faster than your system can handle, so you'd be wasting that excess capability—and paying for it, since 60ns memory costs more than 80ns memory. If you installed 100ns memory, though, you'd be in trouble: Your system would start getting memory errors or slow down significantly.

No-Name Video

Q I bought a super-VGA card at a garage sale and installed it in my PC. It seems to work, but it didn't come with any software, and it's literally a no-name card—I can't figure out who manufactured it. Since it's super VGA, I'd like to run Windows on it at a higher resolution than 640 by 480. Any ideas?
Kyle Ventura, Aberdeen, Maryland

A For higher resolution, you need a Windows driver—a program that lets your card talk to Windows. To identify the card's manufacturer, first take a look at the largest square chip on the card and see if you can make out a name (Tseng, Trident, S3, ATI, or whatever) and the chip's ID number. The name will be that of the controller's manufacturer, which usually writes the drivers as well. If you call and ask nicely, the company will probably send you a high-resolution driver to match your chip.

If you don't see anything coherent on the controller chip, open Windows' Main group and double-click on *Setup*. Select *Options•Change System Settings*, click on the down arrow across from Display to reveal a list of drivers, and choose *Super VGA (800x600, 16 colors)*. This driver probably isn't as fast as one you could get from the manufacturer, but at least it's better than 640 by 480. To install a driver from the manufacturer, follow the same procedure, only choose *Other display (requires disk from OEM)* from the driver list.

A couple of points: First, remember that you need a super-VGA–capable monitor to run at 800 by 600 resolution. The key monitor spec to look for is horizontal scan frequency, which should be 38 kHz or better. Second, if Windows won't load when you install a new driver, run Windows' **Setup** from DOS and change the display to VGA.

A PC Reaches Retirement Age

Q I own an Epson Equity I+ system with a 20MB hard drive. Sometimes I get the message 'Seek error reading drive C:'; other times it just takes a long time to access something on the drive. I've tried repartitioning and reformatting the hard disk, but that didn't help. How can I fix it?
Douglas Esanbock, Spring Valley, Wisconsin

A You're talking about an 8-year-old 8088 system. The hard disk is old, it's tired, and it's having trouble finding hard disk sectors. When your drive was configured, the read/write heads laid down the basic data marking the sectors where the data should go. Now, several centuries later, those heads have drifted out of alignment, and they're having trouble finding the sector information.

You could do a *low-level format*, which rewrites the sector information to align with the heads. Steve Gibson's SpinRite will do this, as will The Norton Utilities and PC Tools Pro. But in your case, this is a temporary measure at best. Hard disks manufactured in the mid-eighties simply weren't meant to last as long as yours has. Count yourself lucky the thing is still spinning.

You could also replace the hard disk and controller, but you'd probably have trouble finding one that's compatible with your old system. In the back pages of my local computer tabloid, the cheapest brand-new system I can find is a 386SX with a 120MB hard disk, a monitor, 4MB of RAM, a keyboard, and two floppy drives. It costs around $500, probably less than your 20MB hard disk cost originally. See what I'm getting at?

A Hard Disk That's Missing Something

Q I recently replaced my original IDE hard disk with a 342MB model. When I installed it, my PC's setup utility gave me only 12 drive types to choose from, none of which matched my new drive. So I picked the type with the largest capacity, 308MB. Unfortunately, I now have 34MB less than I paid for. How can I let the system know I have a 342MB hard disk?
Larry Jasorka, Stirling, New Jersey

A Before you do anything, back up your hard disk, because you'll have to reformat it to reclaim those 34MB.

Most system setup utilities include a user-definable drive type, which is usually called Type 0, Type 47, or Type 99. Pick it from the list of drive types and fill in the blanks. Be prepared to enter a few disk parameters: number of cylinders, number of heads, the preformatted capacity, number of sectors per track, the landing zone, and the starting cylinder for write precompensation.

Your system setup may not require all these specs; if you can't find them in your documentation, get them through your drive maker's fax-back service.

If your system lacks a user-definable drive type, I suggest you shell out $30 for Micro House's EZ-Drive, an IDE hard disk utility available from Insight Direct (800/998-8093). Just insert the program disk in a floppy drive, type **EZ /CUSTOM**, and follow the instructions.

To get the missing 34MB back, you'll need to run FDISK from a floppy and enter the proper capacity for drive C: and any other logical partitions (drives D:, E:, and so on) you may want. (This destroys all data on the disk, so I hope

you remembered to perform the backup.) At this point, enter **FORMAT C: /S** to create a bootable, ready-to-roll, 342MB drive; then restore your data onto it.

The Battle Between Mouse and Modem

Q I just got a new internal modem and a communications program. My modem is configured for COM4, but my communications software tells me COM4 is unavailable. When I changed my modem to COM3, the program worked, but my mouse no longer did. What's happening?
Hyung Jun Kim, Edmonds, Washington

A Let's start with the reason your mouse wouldn't work: PCs have four serial ports, but you can use only two at a time because COM1 and COM3 share one *hardware interrupt*, as do COM2 and COM4. (Two devices can't use the same hardware interrupt—a kind of hot line to the CPU—at the same time.) When you changed your modem to COM3, the mouse was probably on COM1; the two fought for the same interrupt, and your mouse lost.

It's best to start installing serial devices from the lowest COM number. Your mouse is on COM1, so reconfigure your modem for COM2, probably by moving a jumper (your modem's manual or the manufacturer's tech support can tell you how). Then plug the modem back in, turn on your PC, run your system setup utility, and *disable* COM2. Run your communications software setup again, tell the program your modem is on COM2, and everything should run fine.

X-Ray Specs

Q I often travel by air and have been counseled by associates not to subject my notebook to airport security X-ray equipment. According to security personnel, my PC is perfectly safe. What's the real story?
Geoffrey Freda, St. Albert, Alberta, Canada

A Let's put this one to rest once and for all: Airport X-ray machines won't harm your hardware or your data. If you put a camera with high-speed film through one of those things, *then* you might have a problem.

By Eric Knorr

Eric Knorr is a contributing editor for PC World. *Hardware welcomes your questions (see page 10 for contact information).*

This morning Jessye Zane, who is very particular about aesthetics, took a moment to admire our windows.

User-friendly graphic interface

Talk to *PC World* editors

Hundreds of hot PC tips

Search back issues of *PC World*

At 5 pm, Marc Taylor evaluated twelve new software packages, read the latest electronic news, received expert advice on three technical questions, sent mail to 100 potential clients and still had time to buy flowers for a 7pm date.

Thousands of shareware files

PC World's Electronic Mall

Plus Internet E-mail

Call 1 800 621 1258

And after a long night's work, Brad Meyers took a few minutes to let two hundred associates know that Joshua Mark weighed 8lbs. 7oz.

You must ask for the PC World representative to receive your FREE software.

PC WORLD ONLINE

Circle 207 on reader service card

The Contura Aero

7.5 x 10.25 x 1.5 Inches[4]

Powerful 486 Processor

Backlit VGA Screen

Up To 6-Hr. Optional Battery

Instant-On Feature

Optional Docking Base

About 3.5 Pounds[1]

Optional PCMCIA Floppy Drive

Free 3-Year Warranty[2]

Monochrome From $1,399[3]

COMPAQ

© 1994 Compaq Computer Corporation. All rights reserved. Compaq, Contura Registered U.S. Patent and Trademark office. Aero is a trademark of Compaq Com
For information via fax on our limited warranty, consult the Compaq Customer Support Center at 1-800-345-1518, select the PaqFax option and request document numbe

ation. [1]Size and weight indicated are for the Contura Aero 4/25 Model 84 and Model 170. Model 4/33C pictured here weighs 4.2 lbs. [2]Batteries and certain options covered by a one-year warranty. Certain restrictions and exclusions may apply o product information, select document number 4010. [3]Estimated reseller price. Prices will vary. Model 4/33C pictured here starting at $2,199. The Intel Inside logo is a registered trademark of the Intel Corporation.

Circle 35 on reader service card

STAR-DOT-STAR TIPS

Mail Magic

If you use cc:Mail Remote—the DOS program that lets you pick up your cc:Mail messages from home, a remote office, or on the road—you may wish you could set up a batch file that automatically calls your cc:Mail post office and retrieves your messages. It turns out you can. Write your batch file so it first changes to your cc:Mail Remote directory, then uses the command **REMOTE** *password* **COMM/CALL** (where *password* is your cc:Mail Remote password) to poll the post office.

Avi Markson, New York

Editor's note: The REMOTE parameter COMM/CALL is great, especially if used in AUTOEXEC.BAT to download mail each day when you turn the computer on. The command instructs the program to dial your default cc:Mail post office, send and receive messages, then hang up and return to the DOS prompt without ever loading the cc:Mail user interface. To read new mail, you still have to run the program in the normal way.

This trick doesn't work with versions of cc:Mail Remote earlier than 3.2, and suffers from one additional drawback: Each invocation of REMOTE using COMM/CALL tries the call only once, so if you get a busy signal or encounter other difficulties connecting you'll have to try again manually. To make cc:Mail Remote try the call several times before giving up, use the REDIAL.BAT technique, shown in **FIGURE 1**, which interprets REMOTE's exit codes and borrows a looping trick from our April column. For best results, use the CALL command in AUTOEXEC.BAT to launch REDIAL.BAT.

```
@ECHO OFF
C:
CD\CCMAIL
SET COUNTER=1

:START
REMOTE PASSWORD COMM/CALL
SET COUNTER=%COUNTER%1
IF "%COUNTER%"=="11111" GOTO END
IF ERRORLEVEL 3 GOTO MODEM
IF ERRORLEVEL 2 GOTO ESCAPE
IF ERRORLEVEL 1 GOTO START
IF ERRORLEVEL 0 GOTO END

:MODEM
ECHO Modem not responding
GOTO END

:ESCAPE
ECHO Call canceled by pressing ESC

:END
SET COUNTER=
```

FIGURE 1: AUTO-DIAL YOUR CC:MAIL POST OFFICE using REDIAL.BAT. CALL the batch file from AUTOEXEC.BAT to download mail when you boot up.

Saving CMOS on Paper

If your computer loses the contents of its CMOS configuration memory, it will probably fail to boot and remain disabled until you reenter the correct settings in the CMOS setup program. Luckily, there's an easy way to document the settings.

Start the computer and enter the CMOS setup program (as the computer is booting, most BIOSes display the correct keystrokes for activating the program). Make sure your printer is on and connected, then press **<Print Screen>** for the contents of each setup screen. (Remember to print all the screens—including the sometimes-hidden one that selects a disk drive type.) This tip won't keep buggy programs from wiping out your CMOS configuration, but if disaster strikes you'll be able to pull out the setup screen printouts and get things working again quickly.

Allan Karden, CompuServe

Editor's note: Buggy programs aren't the only thing that can scramble your CMOS. A worn-out CMOS battery can cause data loss; so can a lot of jostling, which sometimes interrupts the battery circuit. Printing the screens and saving the output in a safe place is an easy way to get your PC up and running again.

One reminder: If you have an EISA machine, you have more to save than if you have an ordinary ISA computer. The EISA configuration is also kept in CMOS, but it's only accessible through a special EISA configuration utility that you should have received on a floppy along with your computer or motherboard. Print out the configuration using **<Print Screen>** or with the configuration program's printing option, if there is one. You may also want to tell the program to save the EISA configuration to a floppy disk, since it can be complicated and tedious to restore by hand. Finally, keep a bootable floppy disk around so you can boot DOS and run the EISA configuration utility. My EISA machine won't recognize the hard disk controller until after the configuration program has run—so there's no way to boot from the hard disk if the EISA CMOS has been trashed.

A Slash in Time

If you ever type AT commands into your modem, you'll be pleased to hear of a shortcut that lets you repeat the last command instantly. Type the characters **A/** while the modem is in the command state, and the modem repeats the previous command. You don't even need to type **<Return>** after the slash.

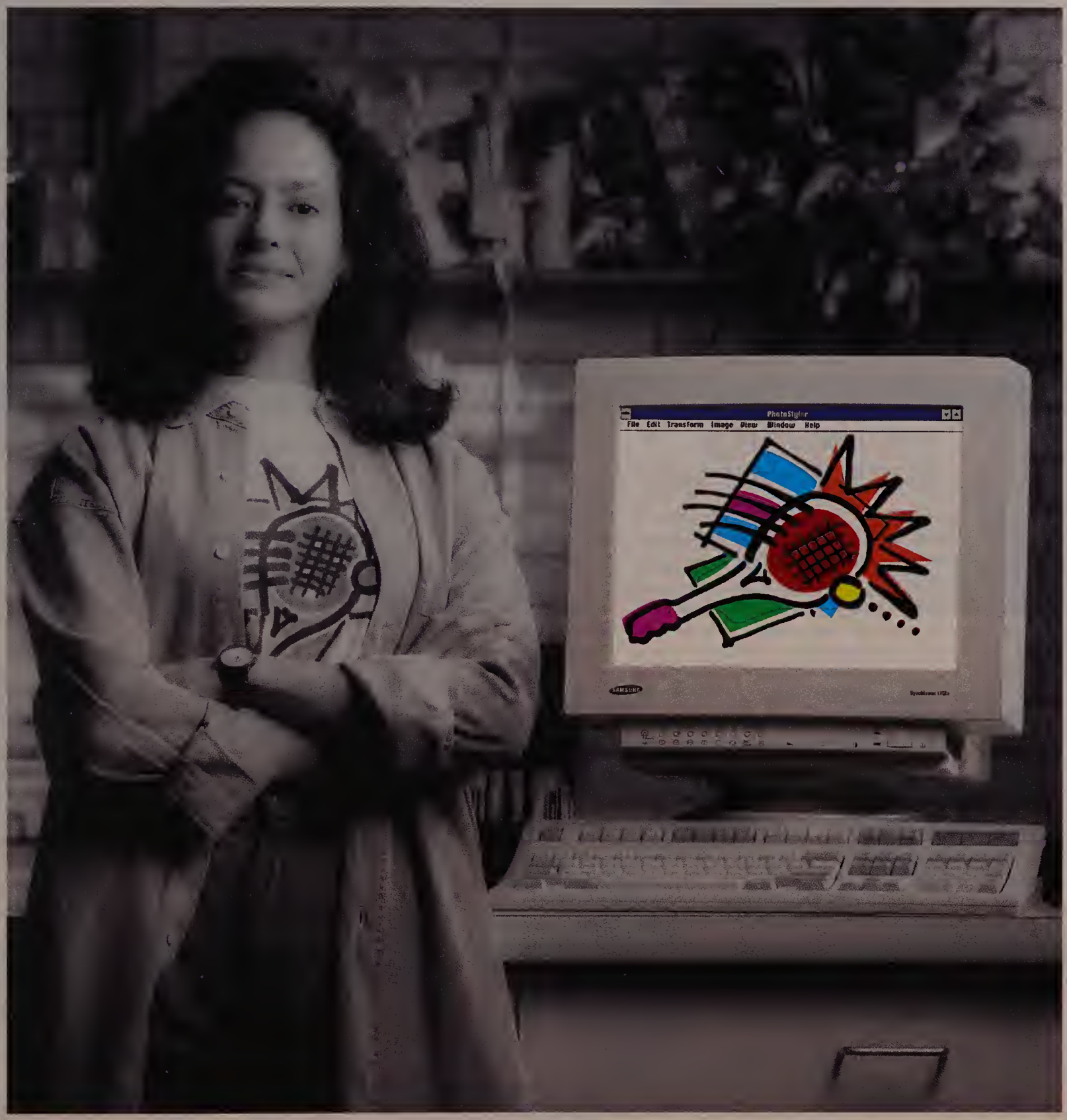
Burt Gross, Los Angeles

Editor's note: A/ is the only command in the standard AT set that doesn't require <Return> to work. This is the fastest way to redial a number if the previous call did not go through, and it reduces the chance of typos when you need to repeat a long, complex command. It's particularly useful if you want to repeat a call after changing modem speed; the modem will recognize A/ despite a speed change.

By Brett Glass

Brett Glass is a PC World *contributing editor.* Star-Dot-Star *welcomes your tips, macros, batch files, and short programs (see page 10 for contact information).*

Samsung
A new point of view.



SyncMaster 17GLs

It's about how you work...Attitude. Satisfaction. Pride. The 17-inch SyncMaster™ monitors reflect today's changing lifestyles. Hassle-free. Value-oriented.

Samsung took for granted you wanted bright, crisp clear images that don't flicker. You're also concerned about safety and energy conservation, so they're standard on the whole series. Life should be as simple as possible, so we added innovative new features like On-Screen Display and Real Color Control, and as you would expect, the GL Series comes with a two-year limited warranty.

Think about how you view your work. Samsung did. And came up with a whole new point of view. For additional information, call 1-800-933-4110.

TECHNOLOGY THAT WORKS FOR LIFE

SAMSUNG ELECTRONICS

SyncMaster	14GL	15GL	17GL	17GLs
CRT Size	14"	15"	17"	17"
Dot Pitch	.28	.28	.28	.26
Maximum Resolution	1024x768	1024x768	1280x1024	1600x1280
Maximum Refresh Rate at Maximum Res. (Hz)	76	76	60	60
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

©1994 Samsung Electronics America Inc. The EPA Energy Star logo is not to be considered a product endorsement. Image on SyncMaster17GLs courtesy of Mike Quon Design Office.

Circle 198 on reader service card

PC WORLD

CLASSIFIED

FOR ADVERTISING RATES AND INFORMATION

CALL 1-800-262-9885

TECH TOOLS

UNIVERSAL PC DIAGNOSTIC TOOL KIT

Micro-Scope is a universal PC diagnostic that runs a proprietary O/S which eliminates DOS limitations and inaccuracies. Ver.5.0 adds 125 enhancements and includes: IDE low-level format, accurate IRQ conflict display, cache memory test, 2 meg video memory test, data recovery capabilities, virus capabilities, and more!

Post-Probe is a universal P.O.S.T. reader card for the non-bootable PC. Post-Probe includes: MCA adapter, tri-state logic probe, 13 LED pre-post test, 7 segment post code display, and a manual with a full explanation of the manufacturer post codes down to the device or chip failure.

Micro 2000

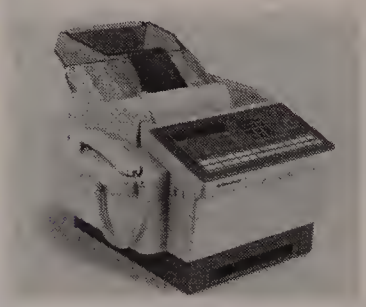
1100 E. Broadway #301
Glendale, CA 91205
TEL: (800) 864-8008
FAX: (818) 547-0397

CIRCLE 457 ON READER SERVICE CARD

INSTANT INFORMATION

PC WORLD Fax-On-Demand System

Advertisers can now provide instant product information and/or price quotes to prospects through PC World's totally automated **Fax-On-Demand system.** Advertisers simply add a PC World 800 number with a unique extension number to their ads. Readers with a touchtone phone access your extension and are guided through a menu. Requested information is then immediately faxed. Leads can be pre-qualified and profiled, with follow-up material or research surveys sent automatically at specified intervals.



For more information on PC World's Fax-On-Demand System, contact your PC World advertising sales representative, or call our Interactive Fax-On-Demand System.

PCW INFO HOTLINE: INSTANT FAX BACK
1-800-234-0455 ext. 117

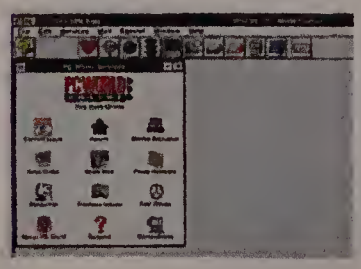
CIRCLE 510 ON READER SERVICE CARD

ONLINE SHOPPING

PC WORLD *EXEC/DIRECT* Online Shopping

Advertisers can sell computer products directly to users of CompuServe through PC World's exciting new *Exec/Direct* Service, on the PC World Online area. Forming a "virtual shopping mall", *Exec/Direct* enables 1.5 million online subscribers to shop for, preview and purchase PC hardware, software and accessory products using their credit cards.

The new service lets buyers browse and place orders 24 hours a day, at any location where they have their PC's. They can preview products as VGA graphics or text-based descriptions, or download a software demo for a test drive.



To advertise on the PC World Online *Exec/Direct* Service: please contact your PC World advertising sales representative or call 1-800-PC WORLD.

To join PC World Online, please consult ordering information located elsewhere in this issue

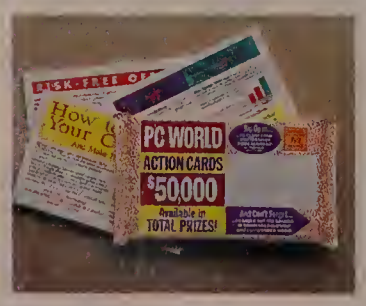
CIRCLE 494 ON READER SERVICE CARD

ACTION CARDS

PC WORLD Action Cards

Advertisers use PC World Action Cards to get direct access to 150,000 managers who buy and use PC's for business. Mailed six times a year, PC World Action Cards is a uniquely effective card deck advertising program delivering PC-proficient managers who buy direct, and have bought a PC-related product within the last 90 days via Direct Response. 60% of them receive no other card deck! Frequency discounts are available to advertisers in PC World's Classified Advertising section.

For more information on selling products by advertising in PC World Action Cards, please call:



PC World
Action Card Sales Department

501 Second Street
San Francisco, CA 94107

Eastern U.S.: 508-820-8113
Western U.S.: 415-978-3353

CIRCLE 471 ON READER SERVICE CARD

MODULAR ACCOUNTING SOFTWARE

BusinessWorks: The Right First Choice

BusinessWorks is an integrated accounting package designed for your small to mid-sized business. Well known for its ease of learning, ease of use, depth of features, and superior networking capability, BusinessWorks gives you hundreds of summary and detail reports that capture real information to help you plan, track, and manage your business.

BusinessWorks is modular so you can add modules as your needs grow. Available in both Windows and DOS, BusinessWorks consists of the following modules: System Manager (required), General Ledger, Accounts Payable, Accounts Receivable, Payroll, Order Entry, Inventory/Purchasing, and Job Cost.

Try BusinessWorks at no-risk for $19.95. To get your hands on a BusinessWorks Test Drive, call (800) 447-5700.

Manzanita Software

2130 Professional Drive,
Suite 150
Roseville, CA 95661

CIRCLE 520 ON READER SERVICE CARD

LIFETIME WARRANTY ON MEMORY
30 DAY MONEY BACK GUARANTEE

+MEMORIES PLUS+

SINCE 1986

2872D Walnut Avenue • Tustin, California 92680

★ Customer Service ★ (714) 731-1505 ★

★ SALES ★

★ (800) 229-3553 ★

VISA · American Express · MasterCard · Discover

TECHNICAL
(714) 731-2791
FAX
(714) 731-2769

WE WILL BUY YOUR OLD 30 & 72 PIN SIMMs/SIPPs & CPUs (ANY QTY)

Mon-Fri 7 am - 5 pm
Sat 8 am - 2 pm
Pacific Standard Time

First IN MOTHERBOARDS AND MEMORIES

PENTIUM PCI VESA LOCAL BUS
Mfg by SUPER MICRO
Made in USA
AT&T and INTEL APPROVED

PEN-586DX90 (256K Cache)	$1399
PEN-586DX90 (512K Cache)	$1449
PENTIUM Fan – Add	$ 20

★ 9 Slots – 4 PCI / 2-VLB / 5-16 Bit ★
★ AMI Bios ★ ZIF Socket ★
★ All Green Features ★
★ Up to 128MB RAM (72 Pin) ★

IDE HARD DRIVES

CONNOR *3 Year Warranty*

210MB	13MS	$199
250MB	12MS	$229
340MB	13MS	$265
420MB	12MS	$289
540MB	10MS	$389

SEAGATE *3 Year Warranty*

260MB	15MS	$228
340MB	12MS	$269
452MB	12MS	$305
545MB	12MS	$399

MICROPOLIS *5 Year Warranty*

1GB	10MS	$ 799
1.7GB	10MS	$1069
1GB	8.5MS	$ 889
1.7GB	8.5MS	$1269

WESTERN DIGITAL *3 Year Warranty*

212MB	13MS	$205
256MB	12MS	$229
340MB	12MS	$269
425MB	12MS	$299
540MB	12MS	$399

BEST PRICES ON SCSI-2 HARD DRIVES

PENTIUM PCI MOTHERBOARDS
★ ZIF Socket ★ 256K Cache (Up to 512K) ★
★ Up to 192 MB RAM (72 Pin) ★

PCI/EISA
★ 3 PCI / 5 EISA Slots ★

Pentium 586DX66 (256K Cache)	$1299
Pentium 586DX60 (256K Cache)	$1199
Motherboard Only (256K Cache)	$ 499

PCI/ISA
★ 4 PCI / 4 ISA Slots ★

Pentium 586DX66 (256K Cache)	$1199
Pentium 586DX60 (256K Cache)	$1099
Motherboard Only (256K Cache)	$ 399

CONTROLLERS

PCI – ADAPTEC – 2940K w/Drivers	$339
PCI – BUS LOGIC – KT946C w/Drivers	$309
EISA – ADAPTEC – 2742K w/Drivers	$379
VLBS – PROMISE IDE Caching (Up to 16MB)	$139
16 BIT – IDE w/2FD/2HD/2S/1P/1GP	$ 19

DX VESA LOCAL BUS
★ 3-VLB / 5-16 Bit ★ ZIF Socket ★
★ Available in 30 or 72 Pin ★
★ Green Features ★ 3.3 or 5 Volt ★

INTEL

486DX4-100 VLB (256K Cache)	$799
486DX2-66 VLB (256K Cache)	$459
486DX33 VLB (256K Cache)	$369
Motherbd w/o CPU (256K Cache)	$119

AMD

486DX2-66 VLB (256K Cache)	$429
486DX40 VLB (256K Cache)	$309

CYRIX

486DX50 VLB (256K Cache)	$449
486DX40 VLB (256K Cache)	$299
486DX33 VLB (256K Cache)	$279

VIDEO BOARDS

PCI – ATI Graphic Turbo PCI 64 (4MB)	$589
PCI – GENOA Phantom (2 MB)	$209
VESA LOCAL BUS	
DIAMOND – STEALTH 64 (2 MB)	$359
GENDA – 8500VL (1 MB)	$119
TRIDENT – 9400VL (1 MB)	$ 99

SIMM/SIPP MODULES

Desc	80NS	70NS	60NS
256×9	$ 12	$ 15	$ 17
1MB×3	$ 38	$ 39	$ 48
1MB×8	$ 38	$ 42	$ 48
1MB×9	$ 42	$ 45	$ 55
4MB×8	$135	$138	$145
4MB×9	$138	$145	$159
16MB×8		$599	$649
16MB×9		$669	$719

72 PIN SIMMS

Desc	80NS	70NS	60NS
1×32 (4MB)	$139	$ 149	$ 169
1×36 (4MB)	$159	$ 169	$ 189
2×32 (8MB)	$329	$ 339	$ 389
2×36 (8MB)	$339	$ 349	$ 389
4×32 (16MB)		$ 619	$ 659
4×36 (16MB)		$ 639	$ 699
8×32 (32MB)		$1099	$1199
8×36 (32MB)		$1189	$1269
16×36 (64MB)		$2799	

CPUS

INTEL		AMD	
PENTIUM 90 MHz	$869	486DX2-66	$299
PENTIUM 66 MHz	$779	486DX40	$199
PENTIUM 60 MHz	$679	**CYRIX**	
4B6DX4-100	$679	486DX33	$169
486DX2-66	$319	486DX40	$189
486DX33	$249	486DX50	$320

LAPTOP AND NOTEBOOK MEMORY FOR ALL BRANDS
AST—COMPAQ—DELL—IBM PS2—NEC
TOSHIBA—ZENITH

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Purchase Orders from Qualified Firms, Universities and Goverment Agencies
ALL PRICES ARE FINAL
TRADEMARKS ARE REGISTERED WITH THEIR RESPECTIVE COMPANIES

CIRCLE 505 ON READER SERVICE CARD

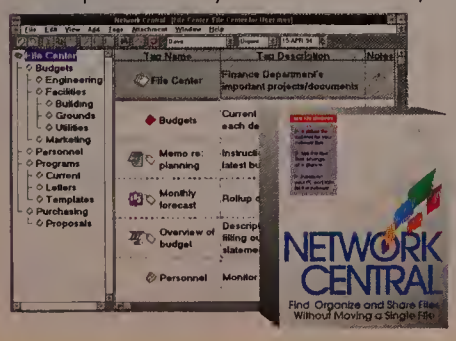
Now You Can Find And Share Files Without Struggling With The Network.

"Network Central™ and NetWare® provide a powerful and easy-to-use file and information sharing solution."
–Toby Corey, Senior Director of Marketing for NetWare Products Division, Novell, Inc.

yes It runs with NetWare

Network Central for Windows is simply the fastest, easiest way to find, organize and share documents, spreadsheets and files, on your network. All without moving a single file or fighting your way through network complexity.

It's designed to be installed by you and used on your PC without interfering with the network. It's a powerful single user tool *and* a real productivity enhancer for any team.



Find. Once you find a file you never have to look for it again, because with Network Central you get back to it with a single click. You can also preview file contents without opening the file itself.

Organize. Simplifies project organization by creating a *virtual file cabinet* for your network. A single location where you or your team can organize project files into folders without moving them from their original locations.

Share. File sharing is easy because Network Central gives you one place to find all the files you need. Even new team members have instant access to project files. Plus it automatically navigates the network for you, even if you're not connected to the drives or servers where the files are located.

Flags changes. Lets you know the moment a file has been added or changed so you can see what requires immediate attention.

Add users. As your need to share files grows, Snap+Together™ design lets you easily add new users one at a time.

For more information or to order, call First Floor today. We'll make your network work for you.

SPECIAL LIMITED TIME OFFER!
BUY ONE FOR $99.95
AND GET A BONUS LICENSE TO USE WITH A FRIEND FREE.
1-800-NEW-NET7
EXTENSION 101
FREE UNINSTALLER 2.0 WITH PURCHASE
Unconditional 60 day money-back guarantee.
FIRST FLOOR

002

CIRCLE 434 ON READER SERVICE CARD

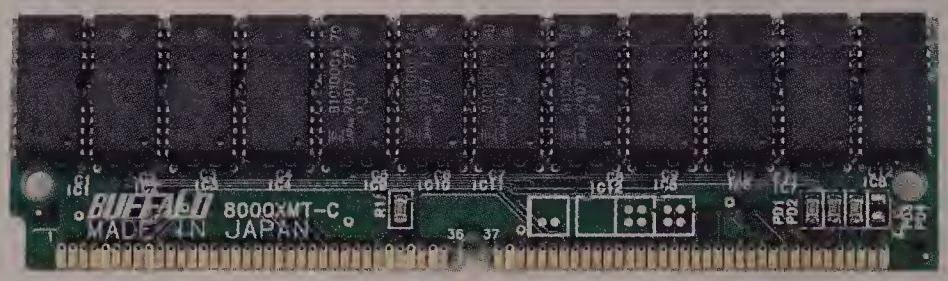
POWER PRINTING - 150,000 cps

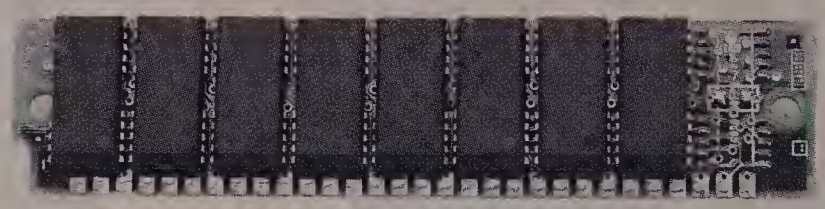
Plug the BuffPort™ into your PC and print to any parallel printer or device. Transfer data from your PC as fast as the printer can accept it, up to 150,000 cps. (A standard PC parallel port is typically limited to about 10,000 cps.) Use the BuffPort with the HWP for a 150,000 cps printer sharing system!

If you have an older printer that does not have an high-speed interface, then connect a CPR buffer to the end of your printer cable and send from the BuffPort at 100,000 cps. The CPR also works as a printer buffer with a standard PC parallel port, but would be limited to the PC port's speed.

BUFFALO is a registered trademark of Melco, Inc. BuffPort is a trademark of Buffalo, Inc.

SIMMs:
1 x 36 & 32
2 x 36 & 32
4 x 36
4 x 8, 1 x 3
PCMCIA





Printer Sharing:

SL	6 ser. & 4 par.
SLP	2 ser. & 8 par.
HWP	5 parallel ports
HXM	2 ser. & 2 par.
HXS	4 serial ports
ASB	5 parallel ports

BUFFALO

2805 19th St. SE, Salem, OR 97302-1520 FAX: (503) 585-4505

(800) 345-2356

CIRCLE 420 ON READER SERVICE CARD

FACT: PC WORLD delivers the managers crucial to your marketing success. 84% of PC WORLD'S employed subscribers are managers the key people your advertising must reach in today's highly competitive marketing environment.

Call Now For More Information 800-262-9885

PC-EXTENDER Plus™

Extend the distance between your PC and a keyboard, VGA monitor, and mouse up to 250 feet!

- Supports PC, PC/XT, PC/AT, PS/2 and 100% compatibles
- Supports monochrome or color VGA monitors
- PS/2 style or Microsoft/Logitech serial mouse support available
- Offers conversion from RGB color to gray-scale

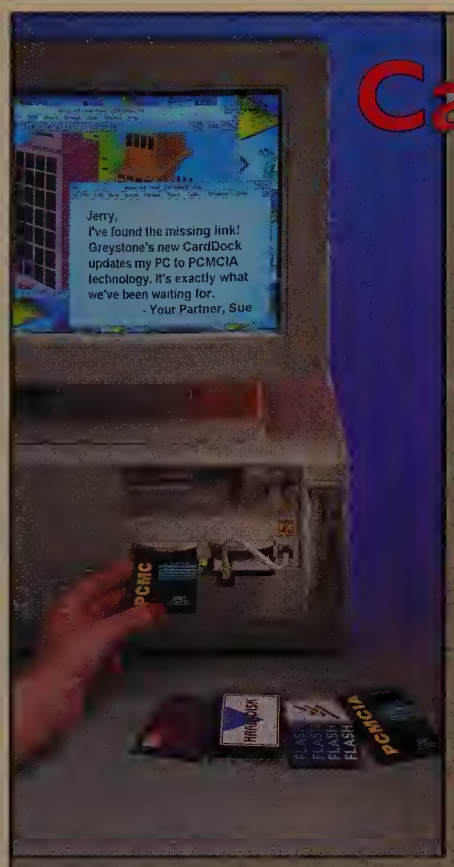
For Macintosh support, ask about our new Mediator™ for Macintosh!

Cybex Corporation
4912 Research Drive • Huntsville, AL 35805 USA
(205) 430-4000 • FAX (205) 430-4030

CYBEX™

PC, PC/XT, PC/AT and PS/2 are trademarks of IBM Corp. Macintosh is a trademark of Apple Computer, Inc. Microsoft and Logitech are trademarks of their respective companies.
Dealer Program Available **Made In USA**

CIRCLE 516 ON READER SERVICE CARD



CardDock™

The PC Link to PCMCIA Technology!

- Use laptop/notebook PCMCIA technology at your desktop
- Get universal support for PCMCIA compliant cards
- Avoid needless software upgrades
- Support multiple combinations of PC Cards (up to 15mm)
- Enjoy convenient front panel phone jack (no long cords)
- Read/write 3V and 5V PC Cards
- Easy-to-install, easy-to-use, easy-to-eject

GREYSTONE®

Greystone Peripherals Inc.
130-A Knowles Drive
Los Gatos, CA 95030
Tel: 1-408-866-4739 Fax: 1-408-866-8328

BELL MICROPRODUCTS
800-800-1513

CIRCLE 406 ON READER SERVICE CARD

PARALLEL-TO-SCSI CONNECTIONS!

"This product . . .is darned near perfect." –Jerry Pournelle Byte Magazine 3/93

"The MiniSCSI Plus is even more elegant than its predecessor and almost twice as fast." –Jim Seymour PC Magazine 12/92

▲ 100% Printer Passthrough ▲ Only 7.2 Ounces ▲ Only $189.00
▲ Compatible with all Parallel Ports ▲ EPP Version Available

The high-performance **MiniSCSI Plus** provides a simple and inexpensive way to connect SCSI devices to the parallel port of your desktop or notebook. For most notebook users, it's the only way to use SCSI devices. Nearly twice as fast as the original **MiniSCSI**, this **MiniSCSI Plus** lets you run up to 7 SCSI devices from almost any parallel port. Plus, an integrated cable makes it a snap to share SCSI devices with desktops and other notebooks.

For more information, see your dealer or call 1-800-934-2766 (1-408-957-7150 for information by fax).

adaptec
I/O. NOW MORE IMPORTANT THAN EVER.

© 1994 Adaptec, Inc. All rights reserved. Adaptec and the Adaptec logo are trademarks of Adaptec, Inc., which may be registered in some jurisdictions. **MiniSCSI** is a trademark of **Trantor** Systems Limited, an Adaptec company. All other trademarks used belong to their respective holders.

2 ADDITIONAL RS-232 PORTS FOR WINDOWS & OS/2!

* Two RS-232 Ports with Full Modem Control Signals
* 16 Bit Address decode allows Windows & OS/2, COM3:, COM4: etc.
* Individually Selectable Address & Interrupt (2-5,10,11,12 & 15)
* 16550s Standard
* FREE Technical Support
* MasterCard, VISA, & COD accepted
* 30 Day Money Back Guarantee
* Part #3088 Price: $89.00

SEALEVEL COMMUNICATIONS & I/O

SEALEVEL SYSTEMS, INC
P.O. Box 830
Liberty, SC 29657
803-843-4343 FAX 803-843-3067

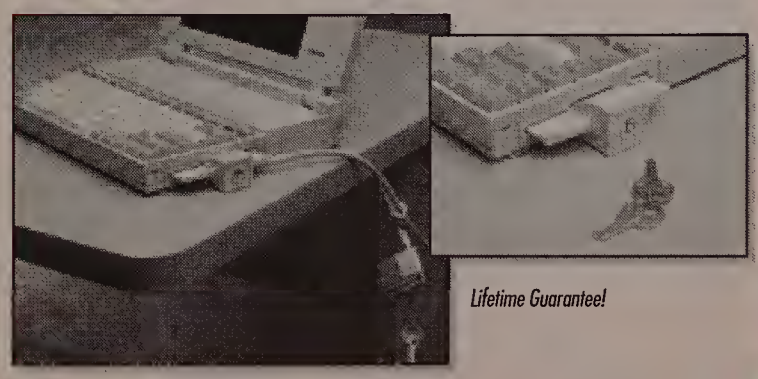
CIRCLE 439 ON READER SERVICE CARD

Sentinel Notebook Security NOW!

STOP NOTEBOOK THEFT!

with the Kablit™ Sentinel's Dual Security Features:

- **Secure Notebook to desk, table, etc.**
- **Lock disk drive — Protect Data**



Lifetime Guarantee!

Portable — Travels with your Notebook
Quick and Easy to Install

TOUGH UNDER FIRE

Padlock Security Provided by Master® Lock

Order now! Call 800-451-7592...

Secure-It

18 Maple Court East Longmeadow, MA 01028

The particular Master Lock Trademarks used are trademarks of the Master Lock Company and are used by Secure-It, Inc. under license.

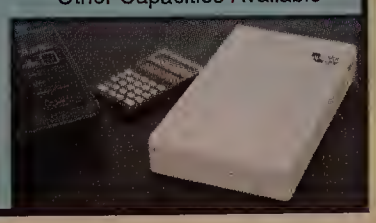
CIRCLE 433 ON READER SERVICE CARD

Top 10 List

Why buy a Mobile Hard Drive

10. Plug N' Play with just about any PC, printer port, SCSI, EPP & PCMCIA
9. 5X more rugged than hard drive
8. Fits in your hand, travel ready
7. Runs as fast as your computer allows
6. Buy one drive but use with many PCs
5. Not obsolete when you buy a new PC
4. Does it all - storage, backup, transport, security & more!
3. Carry your software & data anywhere
2. It's a bargain for its utilities
1. *Fixed disk is so boring!*

420MB
starting at only
$399
Other Capacities Available



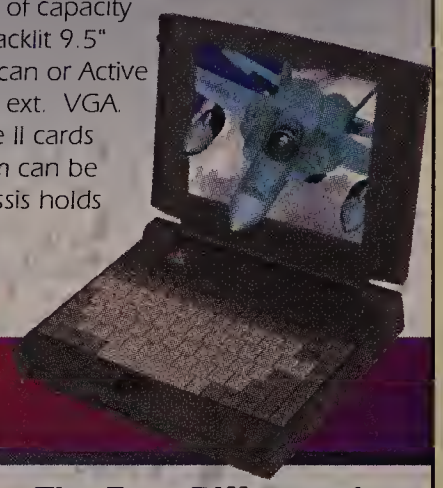
1-800-873-VALU
FAX 408/437-9333
Value stor

CIRCLE 476 ON READER SERVICE CARD

100MHz PowerBrick

Have Your Power and Take It Too!

For no compromise on-the-go use, the PowerBrick is the fastest, most capable notebook available. Enjoy blazing performance with the latest 100MHz 486DX4 CPU and the mobility of a light 6lb. PC. Other features include 4-32MB RAM, accelerated local bus graphics and hard disk with up to 525MB of capacity (1GB with Doublespace). The backlit 9.5" LCD is available in mono, Dual Scan or Active Color and all feature 1280x1024 ext. VGA. For expansion, two PCMCIA Type II cards plus an internal14-14 fax/modem can be utilized while the expansion chassis holds two full length ISA cards.



from **$2,295**

4-Year GE Service Warranty Included

Other New NoteBricks

The Color SubBrick 50

50 MHz 486DX2, Dual Scan Color, 3.9 lbs 7" x 10" x 1.4" thick, 2 Type II PCMCIA, 260MB HD, up to 20MB RAM, 4 Hr. Battery life – from **$2,495**

Call M-F, 9-6 EST

800-633-1925

The Ergo Difference!

- 4-year warranty
- Same day shipment
- RescueMe next day loaner
- Affordable leases
- Satisfaction guaranteed

Ergo COMPUTING

24Hr. Automatic FAX Info
800-723-0778
code 1483

One Intercontinental Way, Peabody, MA 01960 (508)535-7510 FAX:(508) 535-7512

CIRCLE 485 DN READER SERVICE CARD

Bright color. Bright price.

$2,299.

SPECIAL OFFER!

The BOXLIGHT 1200 ColorShow Projection Panel. Our Brightest true-color panel. And for $500 off the list price, it's an unbeatable value.

- Compact, easy-travel panel
- 640 x 480 resolution
- PC and Mac compatible
- FREE remote and cables

Your direct source for all the bright answers.

- Widest selection
- Instant availability
- Overnight shipping
- 30-day guarantee

BOXLIGHT™ CORPORATION

17771 Fjord Dr. N.E., Poulsbo, WA 98370
206/779-7901 • Payment: VISA, MasterCard, American Express, COD and Purchase Orders (some restrictions). Leasing and rental options available. 30-Day Money-Back Guarantee.

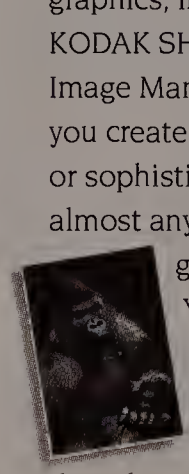
Call Today 1-800-762-5757

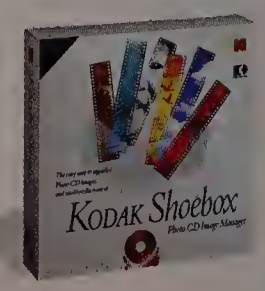
CIRCLE 511 DN READER SERVICE CARD

Where do you keep a 400 lb. gorilla?

In a shoebox, of course.

Here's a quick and easy way to organize and find your files. Including clip art, graphics, images, video, audio, and more. KODAK SHOEBOX Photo CD Image Manager Software lets you create your own simple or sophisticated search criteria. And find almost anything faster. Even a 400 lb. gorilla. You'll work smarter, too. You can share files within a work group. And export images to your favorite applications. So if you need to find things fast, don't let it rattle your cage. Get KODAK SHOEBOX Software. Call 1-800-CD KODAK to order for the special price of $124.99, or for the name of a dealer in your area.





© Eastman Kodak Company, 1994. Kodak, Shoebox, and the Photo CD symbol are trademarks. The Photo CD symbol is for use by Kodak and its licensees only and may not be reproduced without written permission from Kodak

CIRCLE 484 DN READER SERVICE CARD

Now with COMPEL FREE!

TV Elite. Big-Screen Multimedia Presentations Made Easy.

Just connect TV Elite to a VGA card and any TV and *presto!*... big-screen presentations. It's that simple. Compare TV Elite's features to any of the alternatives (all unwieldy and costing up to 10 times as much), and you'll easily see there simply is no other choice.

FREE! With every TV Elite, get "Compel PE." *And* get "Presentation Tools" software, featuring 3 presentation features.

Now for Macs, too!

ADS **TV Elite.** Easily the Best.

For more information about **TV Elite**, *contact Advanced Digital Systems (ADS) at* **(800) 888-5244**. *From outside U.S., call (310) 926-1928*

CIRCLE 442 ON READER SERVICE CARD

The first CD-ROM that uses multimedia to tell you about multimedia!

PC VERSION

The Guided Tour of Multimedia

VIDEO
Capture/Playback video

SOUND
Add music and voice-over

ANIMATION
Makes your work fly

MULTIMEDIA WORLD

Developed and Produced by Graphic Zone

Over 20 hours of fact-packed interactive multimedia information for beginners and professionals!

You'll experience the exciting world of multimedia first hand. The power, the potential, and the easy, step-by-step ways you can harness this useful tool for business, education... or just plain fun! *Experience the wonder of multimedia yourself! It's easy to order!*

Call 1-800-942-4000
From Canada 800-643-7373, International 213-380-7200

Just $39.95 Plus applicable taxes & $3.50 for shipping & handling

Please have your VISA or MasterCard ready when you call. Or send your check or money order to: **The Guided Tour of Multimedia**, 914 S. Hoover St, Los Angeles, CA 90006.

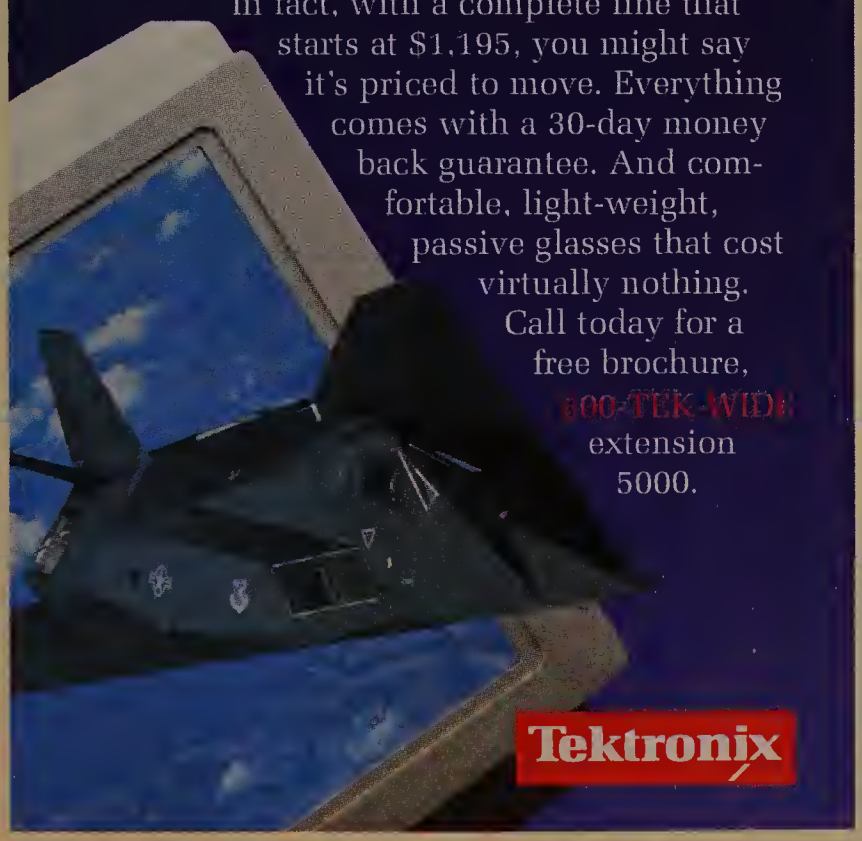
Here's what you need to run The Guided Tour of Multimedia

- PC 386SX or better
- Windows 3.1 or 3.0 with Extensions
- 4MB RAM recommended
- 30MB hard disk
- VGA display, 256 colors
- CD-ROM drive
- Sound board recommend

PC Multimedia PC

3-D At Prices That'll Jump Right Out At You!

The remarkable affordability of our 3-D gear —with patented StereoTek—is no illusion. In fact, with a complete line that starts at $1,195, you might say it's priced to move. Everything comes with a 30-day money back guarantee. And comfortable, light-weight, passive glasses that cost virtually nothing. Call today for a free brochure, 800-TEK-WIDE extension 5000.



Tektronix

CIRCLE 436 ON READER SERVICE CARD

PC WORLD'S PC-proficient managers are involved throughout the buying process. They have the budget authority to sign off on final purchases and the knowledge necessary to recommend and evaluate brands.

Call the PC WORLD Classified Department Now For More Details

1-800-262-9885

IBEX TECHNOLOGIES, INC.

ENHANCED FAX SOLUTIONS

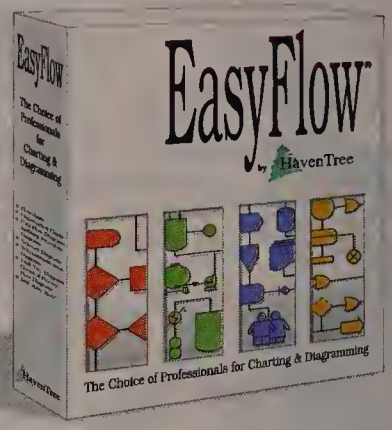
FactsLine® is simply the most powerful and flexible fax-on-demand solution available.

With on-line system management capabilities, sophisticated document presentation, and integrations with Lotus Notes and Aspect Call Center, FactsLine will reduce your costs and increase your productivity immediately.

CALL THE FACTSLINE DEMO TODAY!
1-800-289-9998

CIRCLE 519 ON READER SERVICE CARD

For the 160,000 who waited . . .



It's here for Windows™

If you didn't wait
. . . the switch is on!

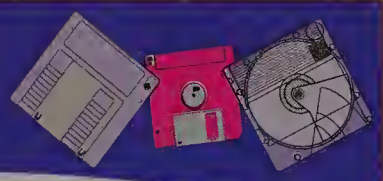
To order call
1-800-267-0668

HavenTree SOFTWARE

HavenTree Software Limited P.O. Box 470 Fineview, NY 13640 Tel:(613)544-6035
EasyFlow is a registered trademark of HavenTree Software Limited. Windows is a trademark of Microsoft Corporation.

CIRCLE 496 ON READER SERVICE CARD

TransferPro™ *for* MS Windows™



Read, Write and Format Macintosh® media
directly from your PC, *also available for* SUN®, SGI®, HP® & OS2®
Makes it easy to format Mac cartridges & floppies

Supports Many Media:
- SyQuest® & Bernoulli® cartridge drives
- Magneto Optical drives
- Data Shuttle drives
- SCSI hard disk drives & diskette drives
- Floppy diskette

Point & Click Transfers
User Friendly & Fast

Digital InstrumentationTech., Inc.
1-800-467-1459 • fax 505-662-0897
tel. (505) 662-1459 • E-mail: tpro-request@dit.com

CIRCLE 408 ON READER SERVICE CARD

FUZZY SPREADSHEET SOLVES MESSY PROBLEMS

MICROSOFT® WINDOWS™ COMPATIBLE

- Fuzzy numbers get a handle on uncertainty without statistics or scenarios
- Ideal for financial models, business plans, forecasts and estimates
- stand-alone, special purpose Windows spreadsheet; requires a 386 w/math coprocessor, 4MB RAM and 4MB HD space
- call now: 800-472-6183

FuziCalc®
Fuzzy number modeling tool

FuziWare, Inc.
PO Box 11287
Knoxville, TN 37939-1287

VISA MasterCard DISCOVER

$99 Introductory special and risk-free 90 day money back guarantee.
Karl E. Thorndike, Founder

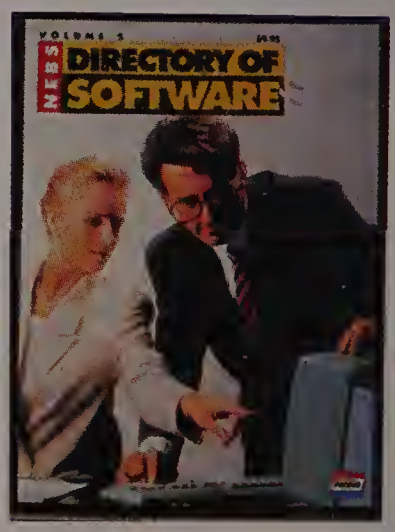
CIRCLE 428 ON READER SERVICE CARD

IF YOU'RE LOOKING FOR SOFTWARE... WE WROTE THE BOOK!

Over 800 listings by market! Find the right software for your business with NEBS easy to use, time-saving guide.

Detailed listings describe software package features, prices, publishers and more.

A $9.95 value, now yours FREE!



NEBS

Call for a FREE NEBS Directory of Software.
1-800-225-9550

Mailcode 84569

CIRCLE 414 ON READER SERVICE CARD

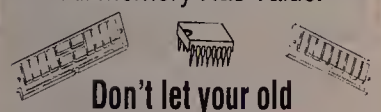
Hardware

Memory Cards

WE'LL PAY *YOU* FOR YOUR OLD MEMORY

1x9, 4x9, 30 Pin, 72 Pin,
Ind. Chips, Mem. Bds., IC Dram Cards

— ANY MEMORY —
All Memory Has Value!



Don't let your old memory collect dust

Call or fax what you have available

1-800-718-7755

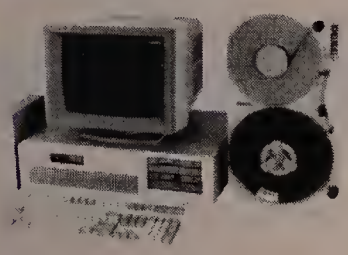
THE MEMORY LIQUIDATORS

"The company that buys memory back"

531 Main St., Ste.1174, El Segundo, CA 90245-3060
Ph. 310-676-3074 Fax 310-676-3076

PERIPHERALS

9-Track Tape Subsystems



Now you can back up, restore and exchange data between your IBM PC and any mainframe or minicomputer using IBM compatible 1600 or 6250 BPI 9-track tape. Transfer rate is up to 40 megabytes per minute on PCs and compatibles. Subsystems include 10-1/2 inch streaming tape drive, tape coupler card, cables and software.

QUALSTAR®
...The Tape Experts

6709 Independence Ave.
Canoga Park, CA 91303
FAX (818) 592-0116
Telephone (818) 592-0061

CIRCLE 417 ON READER SERVICE CARD

FACT: 82% of PC WORLD subscribers have advised an average of 5 people each month on PC purchases.

ACCESSORIES

1-800-8-GLOBAL
GLOBAL
FREE CATALOG

236 page guide to computer furniture, supplies, and accessories
COMPUTER SUPPLIES
11 Harbor Park Dr. Dept. 94 PCW
Port Washington, NY 11050

CIRCLE 508 ON READER SERVICE CARD

Miscellaneous

BAR CODING

BAR CODE READERS

AMERICAN MICROSYSTEMS
2190 A Regal Pkwy. • Euless, Texas 76040 • (817) 571-9015

VISA AM EX MasterCard

FOR PC, XT, AT, PS/2 & TERMINALS:

- No software changes required
- Data appears as keyboard input
- Reads Code 39, I-2of5, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey
- Auto-discriminates between codes
- Accepts WAND, SLOT, CCD, LASER, MAG STRIPE

BAR CODE PRINTING SOFTWARE:

- For Epson, OKI, IBM, Dot Matrix and HP LaserJet Printers.
- Prints Code 39, I-2of5, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey
- Easy To Use

(800) 648-4452 • FAX: (817) 685-6232
30 Day Money Back Guarantee
One Year Warranty

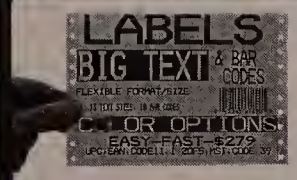
BAR CODING

Bar Code Headquarters

Offices in USA and Europe

Labeling Software
For PC with Dot Matrix or LaserJet

Windows Version!



- Any Format, Any Size
- Formats for Sears, TCIF, K-Mart, Penney's, AIAG, WalMart, Logmars, etc.
- WYSIWYG Design
- Bar Codes: UCC-128, UPC/EAN, 2of5, 128, Code 39, etc.
- Big Text and PCX Graphics too!
- Powerful, Versatile, Easy to Use
- Imports ASCII data files from dBase, etc.
- LabelRIGHT™ for Windows –**$379**
- Above Label Printed by LabelRIGHT™ DOS–**$279**

Cordless Radio Frequency Bar Code Reader

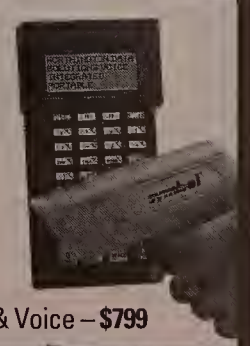
- IBM or Macintosh Attachment
- Keyboard or Serial Interface
- No Software Needed
- Wireless range up to 100'
- No License Required!
- Approved for USA and Canada
- Optional Pocket Beeper – **$395**
- Base Station, Cable, and Wand Complete – **$695**

Bar Code Readers
for PC, XT, AT, PS/2, Macintosh and RS-232 Terminals

- Attaches as 2nd Keyboard
- UPC/EAN, Code 128, 2of5, MSI, Code 39
- Wand, Magstripe, CCD Slot Badge or Laser Scanner
- **Top Rated by Independent Review**
- Complete With Laser Scanner – **$1250**
- CompleteWand only Reader – **$329**

Portable Bar Code Readers
for PC,XT,AT,PS/2,Macintosh, and Serial Interface Computers

With Voice!



- 64K or 256K RAM. Keyboard or serial upload.
- Wand, CCD, orLaser Scanners
- UPC/EAN, 128, 2of5, Code 39
- Display messages and optional Voice Messages tell operator what to do. Any Language.
- Download tables and Pick Lists
- 2 Built-in Inventory Programs
- Easily create Custom Programs
- Complete 64K Unit with Wand & Voice – **$799**

Ordering is Easy!

Call For Our Catalog

- **Same Day Shipping • USA Made**
- **Free UPS Blue in USA**
- **Qualified P.O.'s Accepted**
- **Free "800" Support**
- **30 Day Money Back Guarantee**

European Office: (353) 1 6614 566

800-345-4220

WORTHINGTON DATA SOLUTIONS
Phone: 408-458-9938
Fax: 408-458-9964

BAR CODING

BAR CODE EQUIPMENT

~~FAST GUNS~~
FROM
VARIANT

SYMBOL
LASER SCANNERS

OPTICON
CCD SCANNERS

VARIANT
WAND READERS

Unbeatable Prices!!
Call for a fast quote on any popular bar code scanners, portable readers or accessories

variant microsystems

46560 Fremont Blvd., #105, Fremont, Ca. 94538
Orders: 800-VARIANT
Phne:(510) 440-2870 Fax: (510) 440-2873

CIRCLE 468 ON READER SERVICE CARD

COMPUTER INSURANCE

SAFEWARE

The Computerowners™ Policy insures your computer against **theft, fire, accidental damage, power surge and more!** Rates as low as $49 a year. Now available in Ontario. Call for immediate coverage or information.

1-800-SAFEWARE
or 1-800-800-1492

SAFEWARE
The Insurance Agency Inc
2929 N. High St., PO Box 02211
Columbus, OH 43202

COMPUTER SERVICES

IMAGERS®
OVERNIGHT
$4.95 Slides & Canons
POSTSCRIPT
Digital Output & Production Center
- Slides/Overheads
- Dye-Sub Output
- Large Color Posters
- Canon Fiery Lasers
- Slide Duplication
- 4x5 Neg/Pos/B&W

Photo CD™ Scans $.90
(800) 232-5411
22-7th St. • Atlanta, GA 30308 • 404-873-5353

CIRCLE 409 ON READER SERVICE CARD

DATA RECOVERY

ABSOLUTE DATA RECOVERY!

We rescue data from drives that won't spin, bad tracks, bad FAT tables, flood/fire damage and other catastrophic failures. DOS, Macintosh and Novell operating systems. Recommended by major manufacturers. Small evaluation fee, fast turnaround and reasonable recovery rates.

TOTAL RECALL™
The Data Recovery Experts™
2440 Waynoka Rd.,
Colo. Springs, CO 80915
800/743-0594 • 719/380-7022 Fax

CIRCLE 437 ON READER SERVICE CARD

FACT: 73% of PC WORLD subscribers use Windows!

DISK COPY SERVICE

DUPLICATION FROM $.49
HIGHEST QUALITY MEDIA
From $.49 (5.25") and $.80 (3.50")
- All Diskette Formats
- Custom Labels
- Diskette Mailers / Accessories
- Assembly Services
- Generous Volume Discounts

FORMATTED DISKETTES

QTY 250	SONY VERBATIM	OEM GENERIC
3.5"DD	$.47	$.45
3.5"HD	$.57	$.53

- 10% Discount on First Order
- DOS, Macintosh, or Custom Formats
- Colored Media add $.05
- Private Labeling / Volume Discounts

800-255-3142
Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

MIRROR IMAGES
RIBBON IMAGES
DISKETTE DUPLICATION
Superior duplication . . .
Your reputation depends on it.
Our reputation assures you of it.

- ALL DISK FORMATS
- FAST 24 HOUR TURNAROUND
- EXCEPTIONAL PRICING AND SERVICE

Call for more information and quotation.
800-322-0577
BOWLING GREEN, OHIO

INVENTIONS

FACT: 54% of PC WORLD'S managers purchased the advertised product within a short time of seeing the ad.

SUPPLIES

LASERWRITER TONER CARTRIDGES

Remanufactured cartridges for HP, Apple, IBM, Canon, and others.
$34.95
Ink Jet Refills - We Buy Empties
Visa Accepted

L.C. Products
2331 W. Hampden #109
Englewood, CO 80110
1-(800)-817-3758
Fax (303) 783-0240

CIRCLE 460 ON READER SERVICE CARD

FACT: 82% of PC WORLD subscribers have advised an average of 5 people each month on PC purchases.

QUALITY **TONER** CARTRIDGES
- New • Remanufactured • Recycled
- Apple, Canon, HP, IBM, etc.
- Prices Starting At $25
- We Buy Empties – Call

SAVE THE EARTH
Quality Recharge Co.
3965 Park Ave.
St. Louis, MO 63110
FREE BROCHURE
1-800-238-2333
314-865-0929

CIRCLE 501 ON READER SERVICE CARD

PRESENTATIONS

Infiniter™ Laser Pointer
Attracts the attention of your audience
Presenting, Conferencing, Instructing, Directing

Model # *NBK* Pen Style, Brass casing — **$49.99**

Model # 210 Dual function, Aluminum casing — **$49.99**

*FDA approved & include 2 "AAA" Batteries 1 year warranty

Order call: 800-520-8435
Quarton USA, LTD. CO.
7042 Alamo Downs Parkway, Suite 250,
San Antonio, Texas 78238-4518
Tel: (210) 520-8430 Fax: (210) 520-8433
DEALER AND REP. WANTED

CIRCLE 450 ON READER SERVICE CARD

Software

BUSINESS APPLICATIONS

UPS Shipping Software

Direct interface to Macola, DacEasy, RealWorld, Great Plains and Platinum. Used as TSR can work with almost any software. Also works great stand-alone. Computes zone & charges. Prints Manifests, COD tags, shipping labels, etc. Optional 100WT, GSV, RPS, USPS, FedEx, scale intf. Guaranteed UPS acceptance. 60-Day money back.

V-Technologies
P.O. Box 6261
Wolcott, CT 06716
(203) 879-6960
Fax (203) 879-6962

CIRCLE 461 ON READER SERVICE CARD

FACT: 84% of PC WORLD'S employed subscribers are managers.

CELLULAR

TWO CELLULAR PHONES ONE NUMBER

Change ESN and NAM Info on these cellular phones:
MOTOROLA – MITSUBISHI
PANASONIC – NEC

No soldering! Software comes with cabling diagrams to connect your phone to your PC!
Only $495.00 for the complete package!

CELLULAR PRESS
421 N. Rodeo Dr. #15318 •Beverly Hills, CA 90210
PHONE: 310-289-2174
FAX on demand:1-800-438-4511 or 305-346-7674
Call from your fax handset – follow the voice prompts to receive complete technical specifications!
Sold for educational purposes only

CHURCH APPLICATIONS

CHURCH SOFTWARE

Discover for yourself why more churches are choosing **PowerChurch Plus.®**
Try out the leading membership and accounting package.
Call today for Free information in the mail.
F1 SOFTWARE, 208 Ridgefield Drive, Asheville, NC 28806
800/486-1800

CIRCLE 482 ON READER SERVICE CARD

Bible Book Store on Disk

Full featured, fast and friendly Bible Study Software. As the leader in Bible Study Software since 1981 we have continued to listen to our customers and provide them with the tools they need. We offer a complete line of Windows and DOS Bible Study Tools.
Call for **free Catalog.**

Bible Research Systems
2013 Wells Branch Pkwy #304
Austin TX 78728
800/423-1228 • 512/251-7641

Church Partner

New accounting, new features -- the best has gotten better. Before you buy -- look at our system's power, simplicity, and unique ability to fit into your church needs -- now, one of the most affordable systems around with 10 years of use by hundreds of churches. For IBM compatibles, networks

Summit Systems Inc.
Suite 121, 16 Berry Hill Road
Columbia, SC 29210 USA
803/798-9749, 800/228-5857
Fax: 803/731-0349

FACT: 82% of PC WORLD subscribers have advised an average of 5 people each month on PC purchases.

Church Management Systems

Expect the best!

- *Outstanding Reporting*
- *Superior Support*
- *Integrated Modules*
- *Over 1500 Users*
- *Free Preview Disk*

1-800-247-8044

TSL - 3300 Bass Lake Road, -#304
Brooklyn Center, MN 55429
FAX 612-566-2250

CIRCLE 415 ON READER SERVICE CARD

DATA ENTRY

Viking Data Entry

Professional Quality Software
- Used by U. S. Census
- Advanced Validation
- Sequential/ISAM files
- MS/DOS, UNIX, XENIX, VMS, AIX
- Technical Support
- Re-key verify

Viking Software Services
4808 E. 67th St. Ste. 100
Tulsa, OK 74136
918/491-6144
FAX: 918/494-2701
800/324-0595

THE DATA ENTRY EMULATOR™

Full featured, heads-down entry, with two-pass verification, batch control, output record reformat, operator stats, edit language, customizable menus, help text. Free technical support.

PC from $395
Also for LAN's, IBM AS/400™, IBM S/36
FREE trial
206/776-6443
800/356-0203

COMPUTER KEYES
21929 Makah Rd.
Woodway, WA 98020

EDUCATION

B.S. & M.S.
In Computer Science

- ALL COURSES HOME STUDY
- Approved for tuition reimbursement by leading corporations
- Increase your earning power
- Join students from leading computer companies
- Using Windows, C++ and Ada courses available.

For free information call
1-800-767-AICS

AMERICAN INSTITUTE FOR COMPUTER SCIENCES
ACCREDITED MEMBER
World Association of Universities and Colleges
A Global Accreditation Association

FACT: PC WORLD subscribers who are involved in the buying process buy for an average of 86 PC's each.

EDUCATION

Student-Teacher-School Discounts! *Full & Latest Ver.*

MS Office 4.2 STD	$239	PageMaker 5.0	$299
Photoshop 2.5.1	269	WordPerfect 6a	135
MS Access 2	$139	MS Word 6.0a	$139
Illustrator 4.01	199	MS Excel 5.0	139
MS Publisher	79	Mathematica 2.2	199
Paradox 45	$ 99		
Painter 2.0	199		
MS Encarta	85		

Info/Cat (201) 569-6262 Orders Toll Free (800) 377-9943 V/MC/MO/COD
SOFTWARE PLUS Academic Inc., 50 East Palisade Ave.#200, Englewood, NJ 07631

CIRCLE 479 ON READER SERVICE CARD

FINANCIAL

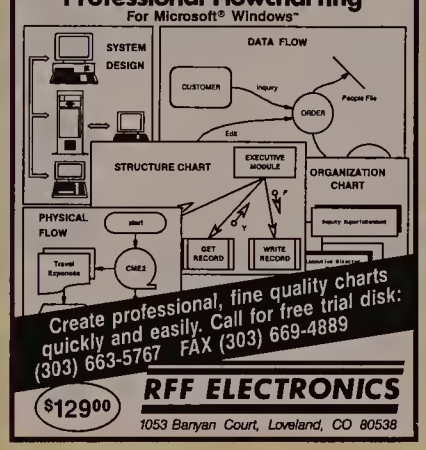
Loan-Amortization

EXEC-AMORT. Replace Desktop Financial Calculators, Avoid Inaccuracies, Quit Using Your Spreadsheet, Store Loans to Disk, Solve for PV, FV, I, PMT, N. Easy to read amortization reports, fixed & ARM's, APR's per Reg Z, Points & Fees, Balloons, irregular & skipped payments. $149.95 US + $5 s/h. Int'l add $25

ELECTROSONICS
36380 Garfield Rd., Suite 1
Clinton Twp., MI 48035
800-858-8448, 810-791-3010 fax
Int'l phone: 810-791-0770

FLOW CHARTING

RFFlow
Professional Flowcharting
For Microsoft® Windows™



Create professional, fine quality charts quickly and easily. Call for free trial disk:
(303) 663-5767 FAX (303) 669-4889

$129.00
RFF ELECTRONICS
1053 Banyan Court, Loveland, CO 80538

FACT: 73% of PC WORLD subscribers use Windows!

FORTRAN

Lahey Fortran

New! 32-Bit Fortran 90
•
FORTRAN 77 Professional and Student Versions
•
New Code or Downsizing
•
Includes Suite of Tools
•
Free Technical Support
•
A Decade of PC Fortrans

(800) 548-4778 or (702) 831-2500
Fax: (702) 831-8123

CIRCLE 470 ON READER SERVICE CARD

MUSIC

SongWright V

MUSIC PROCESSOR prints professional sheet music, songs, scores with text, chords, dynamics. Compose, edit, record, play, transcribe, copy, transpose, extract import, publish - all in standard notation. Symbol editor/librarian. PC, MIDI/AdLib, or SMF entry & playback. Matrix/laser/Deskjet printers. $119.95+$5 s/h. Free sample output.

SongWright Software
7 Loudoun Street, S.E. Ste 5B
Leesburg, VA 22075
1-800-877-8070, 703-777-7232j2

GRAPHICS

6,000 Fonts

*2500 Truetype, 2500 Type 1 and 1000 Geoworks Fonts
* CD-ROM * Uncompressed * Unlocked * Original Designs *
* No Duplicates * Highest Quality Available * Categorized *

Jazzy Roman Spotted UNIQUE Wacky
Warped WAVEY Contour Cracked 3D
Holey Hollow Spiked STRIPED Shadow

Order now-Get 6,000 Fonts & 300 page book for $49.99 +$5.00 s/h
Ask about our Clipart
1-800-951-0877
Free Sampler CD Available Just $4.95 s/h
Fantazia Concepts Inc * P.O. Box 5142 * Willowick Ohio 44095
216-951-5666 Voice * 216-951-9241 Fax * FantaziaC@AOL.COM E-mail

CIRCLE 403 ON READER SERVICE CARD

MAIL ORDER

The Mail Order Wizard

Complete management system for a catalog, inbound telemarketing, or mail order company. Order processing, inventory mgt, ad forecasting, sales/banking, list mgt, modem charge approval, EDC, UPS manifest w/scale interface. Single and Multi User Systems. Inbound/Outbound Editor's choice.

Haven Corporation
1227 Dodge Ave., Dept. W93
Evanston, IL 60202
800/676-0098, 708/869-3434

Mail Order Manager (M.O.M.)™

America's most popular, complete, and affordable solution for the mail order business - order entry/review, credit card processing with draft capture, UPS manifesting, profit analysis, accounting, telemarketing, list management. Clipper compiled, dBase III + files. Single and Multi-user versions. Find out why more people buy MOM after comparing! Call for demo kit.

Dydacomp Development Corporation
150 River Road, Suite N1, Dept. PCW
Montville, NJ 07045
(800)858-DMOM (201) 335-1256

ON-LINE SERVICE

FREE GIFS

Download some of the most Entertaining Images from our On-Line Magazine - FREE !

LACE is an On-Line Magazine that offers you:

- ABSOLUTELY the best Color Photographs and Color Scans in the WORLD & not available on any other BBS !
- SWIMWEAR, LINGERIE & FIGURE MODELS who create images that stir your imagination.
- VIDEO for Window's Files, the latest and hottest Microsoft Product. Play these Video Movies on your Computer and watch our models come to life on your computer screen.
- LOCAL ACCESS #'s for over 800 cities in the U.S.
- HIGH SPEED access available. (14.4k down to 1200 baud)
- AND . . . RATED #1 BY OUR USERS ! !

Set your Modem to 8-N-1 and your terminal to ANSI Graphics

(818) 709 - 4275
Questions? Call our voice line at (818) 709-3795.

LACE
the on-line magazine
Limited Offer

CIRCLE 447 ON READER SERVICE CARD

PUBLIC DOMAIN/SHAREWARE

WHO ELSE

BUT THE LARGEST SHAREWARE CLUB IN THE WORLD TO ANSWER ALL OF YOUR SOFTWARE NEEDS!

THE ANSWER IS SIMPLE

SOFTWARE OF THE MONTH CLUB®

619-931-8111 X510 FAX 619-929-1163

CIRCLE 412 ON READER SERVICE CARD

$1.50 SHAREWARE SPECTACULAR

FREE CATALOG
OVER 600 PROGRAMS
NO Minimums, NO Gimmicks, NO Clubs
Business, Windaws, Games, Education
24-Hour, Toll Free Ordering

SHAREWARE EXPLOSION CD-ROM – $49
Over 5,000 Programs – Menu Driven
We Carry a Full Line of Adult CD-ROMS and FULL-LENGTH ADULT MOVIES ON CD-ROM
3-D SWIMSUIT CD-ROM/500+ pictures $69
S Software, 2880 Bergey Rd., Dept 600BB
Hatfield, PA 19440 • (800) 243-1515 / 24 Hrs.

CIRCLE 405 ON READER SERVICE CARD

ICA Software
DARE TO COMPARE
Highest Quality
Lowest Price
SHAREWARE
Guaranteed!!!
Free Catalog
800-331-3065
FAX: 203-459-0823
P.O. BOX 272 Monroe, CT 06468-0272

CIRCLE 463 ON READER SERVICE CARD

FACT: 54% of PC WORLD'S managers purchased the advertised product within a short time of seeing the ad.

ULTIMATE MODEM
Call from home or office!
•The Ultimate BBS•

FREE
- Lively Network Chat
- 100,000 Shareware & GIF's, Windows, Mac and DOS files
- Free Internet Accounts
- UNLIMITED ACCESS
- Unlimited Downloads
- Up to 16.8k on all 96 Lines
- New GIF's posted daily by our photographers

1-217-792-3663
Customer Support Voice Line 415-281-4429

FACT: 84% of PC WORLD'S employed subscribers are managers

FACT: 73% of PC WORLD subscribers use Windows!

SURVEYS

The Survey System

Analyzes: marketing, public opinion, customer satisfaction, employee attitude surveys. Handles mail, personal, phone, scanner, disk-by-mail or computer interviews. Records verbatim text and actual voice answers. Graphics, network version, user friendly. Free support.

Creative Research Systems
140 Vista View - Ste 101
Petaluma, CA 94952-4728
Ph (707)765-1001
Fax (707)765-1068

STATISTICS

NCSS 5.x Series - $125

Easy-to-use menus & spread sheet. Multiple regression. T-tests. ANOVA (up to 10 factors, rep. measures, covariance). Forecasting, Factor, cluster, & discriminant analysis. Nonparametrics. Cross Tabulation. Graphics: histograms, box, scatter, etc. Reads ASCII/LOTUS. Many new add-on modules.

NCSS
329 North 1000 East
Kaysville, UT 84037
Phone: 801-546-0445
Fax: 801-546-3907

UTILITIES

FREE PROGRAMS

That's right! Now you can free your software from those troublesome hardware locks. Don't buy a new program because they won't replace your lost ore stolen hardware lock.

Our SAFEKEY software programs are guaranteed to UNLOCK the following:
TANGO PRO CADKEY 3D-STUDIO
SURFCAM4 MASTERCAM TOPAS
EZCAM MICROSTATION & MORE

*NEW- If your program uses ANY Rainbow Technologies Inc. lock, protect it from being lost or stolen with the PC-KEY and now the WINKEY

From $300 plus S&H
(609) 390-2799
(609) 390-3750 FAX
IMAGINE THAT
1 EVERGREEN DR. SEAVILLE, NJ 08240

CIRCLE 486 ON READER SERVICE CARD

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 1273 SCRANTON, PA

POSTAGE WILL BE PAID BY ADDRESSEE

INTERNATIONAL CORRESPONDENCE SCHOOLS
925 OAK STREET
SCRANTON PA **18540-9888**

ICS
SINCE 1890

YES! *Send me the FREE information package for the one course I've checked that explains how ICS can train me for a successful new career.* ***CHECK ONE BOX ONLY.***

☐ **MASTER PROGRAMMING**

Other Computer Careers:

☐ Computer Programming/BASIC
☐ Computer Programming/COBOL
☐ PC Specialist
☐ ASB Degree in Applied Computer Science
☐ Desktop Publishing & Design
☐ PC Repair
☐ Computer-Assisted Bookkeeping
☐ Computer-Assisted Small Business Management

Career Diploma Courses:

☐ Electrician
☐ Medical Office Assistant
☐ High School
☐ Legal Assistant
☐ TV/VCR Repair
☐ Appliance Repair
☐ Professional Locksmithing

ASB and AST Degree Programs:

☐ Business Management
☐ Accounting
☐ Mechanical Engineering Technology
☐ Electrical Engineering Technology

CALL TOLL FREE **1-800-596-5505**
Ext. 5149
CALL ANYTIME—*24 hours a day, 7 days a week.*
OR MAIL THIS CARD TODAY!

Name _____ Age _____
Address _____ Apt. # _____
City/State _____
Phone ( ) _____
DEPT. PSVT84S PC World 02KA

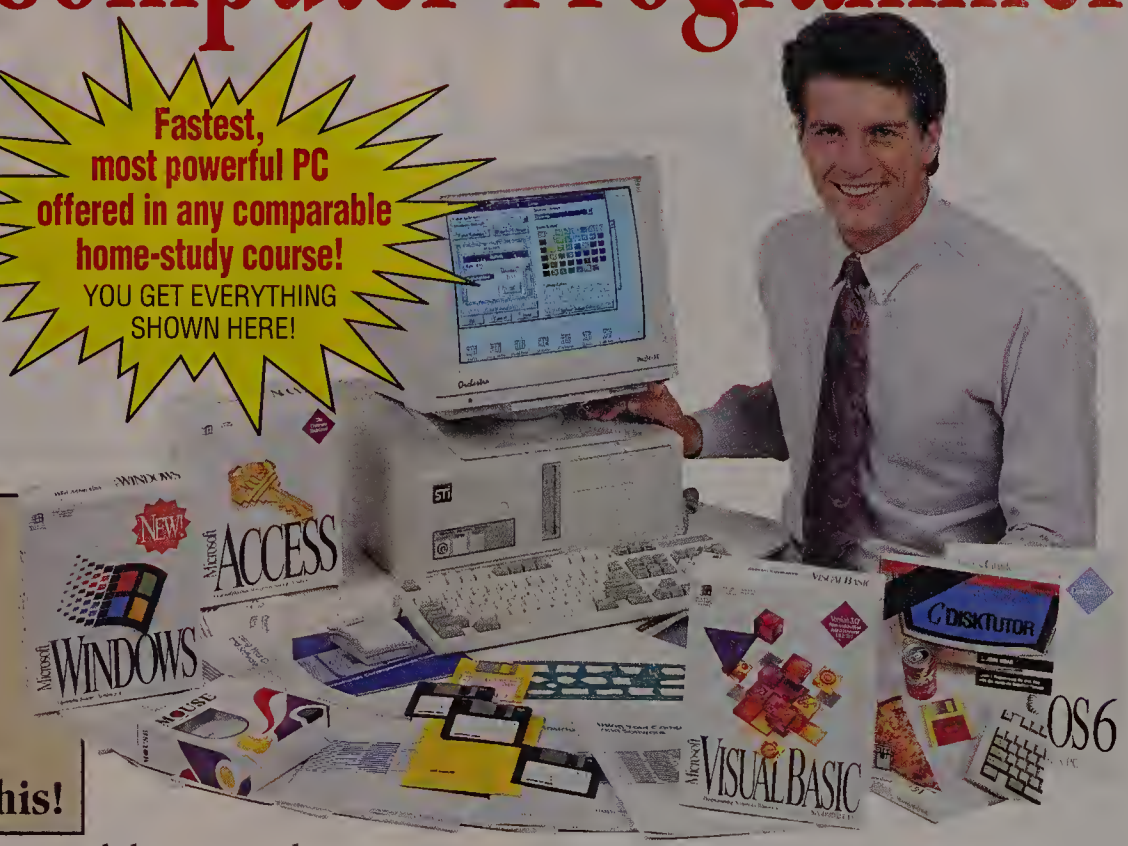
Be a Master Computer Programmer

The software you want—the computer you need—and the only at-home training that can get you up to speed fast with today's in-demand languages and applications!

Windows™ 3.1! DOS 6! Visual Basic™ 3.0! C! Access™! And more!

Train at home for a good-paying career as a computer professional!

Fastest, most powerful PC offered in any comparable home-study course!
YOU GET EVERYTHING SHOWN HERE!



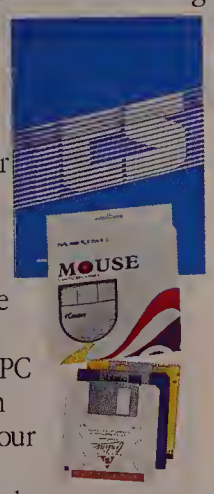
GET THE ICS EDGE!

- ☑ The 486DLC/33MHz computer!
- ☑ The software! ☑ The training!
- ☑ The ICS Online connection!
- ☑ The dedicated support of your instructors and our entire faculty!

No other school gives you all this!

Your ICS PC includes all these special features:

- Cyrix's 486DLC processor—the one that beat the i486SX in independent benchmark testing!
- 33MHz operating speed
- 80MB hard drive
- 4MB of RAM—factory installed!
- 14" Super VGA color monitor
- 2400-baud internal modem
- 1.44 high-density floppy disk drive
- Microsoft®-compatible mouse
- FREE **America Online®** software that connects your PC to the world! Once you sign on, check out **ICS Online,** our electronic campus. We're available to our students on the America Online PC network! Only ICS offers you this "online" advantage!



No previous experience needed! Get the skills to master today's most popular PC applications!

Now at home in your spare time you can learn how to write computer programs for both Windows and DOS. Step by step ICS trains you to design, code, run, debug and document executable programs you can use. Explore the infinite possibilities of Visual Basic programming in Windows. Unleash the extraordinary capabilities of Access—Microsoft's relational database for Windows. Discover the freedom and power at your fingertips when you know how to program in C. And learn your way around DOS and Windows as you master computer programming on your own 486DLC personal computer.

Make good money! Programmers average $35-40,000 a year! Start your career now... with ICS computer training!

From the moment you open your very first lesson, you'll be thinking like a computer programmer, learning the proper procedures and the advanced techniques from successful programmers and computer specialists who helped ICS develop this one-of-a-kind course!

More people have mastered computer programming at home with ICS than with any other home-study school in the world. Here's why:

Employers recognize ICS training—More than 2,000 major corporations, including IBM, Xerox and more—use our training system because our proven "Quick Learn" method of instruction really works!

You get the best in brand name equipment—You receive five of today's most recognized software packages: Windows, DOS 6, Visual Basic, C and Access. And your PC is configured to the exact specifications required for your training! There are no extras for you to buy!

Your instructors are as close as your phone—or your computer! ICS gives you a 24-hour toll-free telephone number to call when you have questions about your course. And, with your ICS connection on America Online®, you can leave messages for your instructor, talk to fellow students, attend "real-time" ICS classes and chat sessions, and take advantage of the hundreds of online services available—all without ever leaving your PC!

Your training has been reviewed and accredited by the National Home Study Council—So you can be assured it meets their standards of excellence.

Your tuition is affordable—and there are no finance charges on our easy fit-any-budget payment plans. You won't find a comparable course at a more reasonable price.

ICS CAN TURN YOU INTO A MASTER PROGRAMMER!

Send today for Free Facts!

See for yourself why ICS is the world leader when it comes to training people in computer skills at home. Whether your goal is a career, a business of your own, or a better understanding of computer programming, the ICS Master Programming Course can start you on your way to a money-making future in this in-demand field

FOR FASTEST SERVICE, CALL TOLL FREE

1-800-596-5505 EXT. 5149

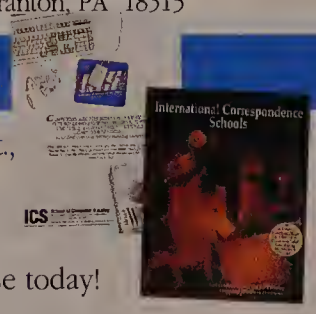
Call Anytime—24 hours a day, 7 days a week.

MAIL POST-PAID CARD FOR FREE FACTS!

If card is missing, use the handy coupon. Or, if coupon is missing, write to us directly for FREE facts on our Master Programming Course:
ICS School of Computer Training, **Dept. PSVT84S**
925 Oak Street, Scranton, PA 18515

01KA

Send Today For Free Facts!



ICS Computer Training **Dept.PSVT84S,** 925 Oak St., Scranton, PA 18515

CHECK ONE BOX ONLY

☐ **YES!** I want to Master Computer Programming.
Send me FREE FACTS on your Master Programming Course today!
No obligation. No salesman will visit.

Instead, send me FREE information on one of your other computer training courses:

☐ Programming in BASIC	☐ PC Repair
☐ Programming in COBOL	☐ ASB Degree in Applied Computer Science
☐ PC Specialist	☐ Computer-Assisted Bookkeeping
☐ Desktop Publishing & Design	☐ Computer-Assisted Small Business Management

Name_____ Age_____
Address_____ Apt.#_____
City/State_____ Zip_____
Phone ( ) _____

17

MEMORY DATA STORAGE

LIFETIME* WARRANTY 100% GUARANTEED

1x9 70NS $45

4x9 70NS $145

SIMM-SIPP MODULES

4MB X 9-80NS SIMM-PC	145	256K X 9-100NS SIMM	13	1MB X 9-70NS SIPP	50
4MB X 9-70NS SIMM	145	256K X 9-80NS SIMM	14	1MB X 9-60NS SIPP	53
4MB X 9-60NS SIMM	160	256K X 9-70NS SIMM	15	256K X 9-100NS SIPP	18
1MB X 9-100NS 9 CHIP SIMM	38	256K X 9-60NS SIMM	18	256K X 9-80NS SIPP	19
1MB X 9-80NS 3 CHIP SIMM	39	1MB X 8-80NS SIMM	41	256K X 9-70NS SIPP	20
1MB X 9-80NS 9 CHIP SIMM	44	1MB X 8-70NS SIMM	42	256K X 9-60NS SIPP	23
1MB X 9-70NS 3 CHIP SIMM	40	4MB X 8-80NS SIMM	150	256 X 36 – 1MB	50
1MB X 9-70NS 9 CHIP SIMM	45	4MB X 8-70NS SIMM	150	512 X 36 – 2MB	95
1MB X 9-60NS 3 CHIP SIMM	42	1MB X 9-100NS SIPP	43	1 X 36 – 4MB	159
1MB X 9-60NS 9 CHIP SIMM	48	1MB X 9-80NS SIPP	49	2 X 36 – 8MB	319
1MB X 9-53NS 9 CHIP SIMM	CALL			4 X 36 – 16MB	619
16MB X 9-70NS SIMM	660				

IBM

COMPAQ

TOSHIBA

AST

NEC

HARD DRIVES

Seagate

FACTORY NEW – 1-5 YEAR WARRANTY

IDE				
130MB	ST3145A	15MS	3.5X1"	$166
128MB	ST9145AG	16MS	2.5"	260
260MB	ST3290A	16MS	3.5X1"	212
340MB	ST3391A	12MS	3.5"	240
209MB	ST9235AG	16MS	2.5"	345
452MB	ST3550A	12MS	3.5X1"	325
540MB	ST3655A	12MS	3.5"	365
SCSI				
452MB	ST3550N SCSI-2	12MS	3.5X1"	424
540MB	ST3655N SCSI-2	11MS	3.5X1"	449
340MB	ST3390N SCSI-2	12MS	3.5X1"	320
1.35GB	ST41600N	12MS	FH	1350
1.2GB	ST11200N SCSI-2	10MS	3.5"	748
1.2GB	ST31200N	8MS	3.5X1"	729
1.2GB	ST41200N	14MS	FH	958
2.1GB	ST42100N SCSI-2	14MS	FH	1399
2.1GB	ST42400 SCSI-2	11MS	FH	1450
3.6GB	ST43400N SCSI-2	10MS	FH	1879
1.7GB	ST11900N	8MS	3.5"	1058
1.7GB	ST11950N SCSI-2	8MS	3.5"	1477
2.1GB	ST12550N SCSI-2	8MS	3.5"	1650
2.2GB	ST12400N SCSI-2	12MS	3.5"	1395
4.1GB	ST15150N-W	8MS	3.5"	CALL
8.0GB	ST410800N-W	11MS	FH	CALL

CONNER

FACTORY NEW – 1 YEAR WARRANTY

IDE				
170MB	CFA170A	17MS	3.5X1"	$179
210MB	CFS210A	12MS	3.5X1"	185
340MB	CFA340A	14MS	3.5X1"	246
420MB	CFS420A	14MS	3.5X1"	263
540MB	CFA540A	10MS	3.5X1"	355
SCSI				
170MB	CFA170S	13MS	3.5X1"	195
340MB	CFA340S	13MS	3.5X1"	299
540MB	CP30540 SCSI-2	10MS	3.5"	475
1.0GB	CP106 SCSI-2	10MS	3.5"	719

WESTERN DIGITAL

FACTORY NEW – 3 YEAR WARRANTY

IDE				
212MB	WD1210	12MS	3.5X1"	$205
250MB	WD2250	14MS	3.5X1"	219
270MB	WD1270	11MS	3.5X1"	CALL
340MB	WD2340	12MS	3.5X1"	246
420MB	WD2420	13MS	3.5X1"	274
540MB	WD2540	11MS	3.5X1"	372

MICROPOLIS

FACTORY NEW – 5 YEAR WARRANTY

IDE				
1.0GB	2210A	10MS	3.5"	$735
1.75GB	2217A	10MS	3.5"	958
SCSI-2				
1.0GB	MC2210	10MS	3.5"	748
1.2GB	MC4110	9MS	3.5X1"	700
1.2GB	MC1598	15MS	FH	799
1.6GB	MC1908	10MS	FH	1099
1.75GB	MC2217	0MS	3.5"	948
2.0GB	MC1548	14MS	FH	1173
2.1GB	MC1926	11MS	3.5"	1348
3.6GB	MC1936	11MS	FH	1948
4.1GB	MC4410	8MS	3.5"	CALL
9.0GB	MC1991	11MS	FH	CALL

Quantum

FACTORY NEW – 2 YEAR WARRANTY ELS & LPS
5 YEAR WARRANTY ON P DRIVES
1 YEAR WARRANTY ON 2.5" DRIVES

CAPACITY	M/N	SPEED	SIZE	PRICE
127MB	ELS127A	17MS	3.5X1"	$189
170MB	LPS170A	17MS	3.5X1"	195
340MB	LPS340A	16MS	3.5X1"	329
540MB	LPS540A	10MS	3.5X1"	375
SCSI				
127MB	ELS127S	17ms	3.5X1"	189
170MB	LPS170S	17MS	3.5X1"	195
340MB	LPS340S	18MS	3.5X1"	265
540MB	LPS540S SCSI-2	10MS	3.5X1"	385
1.0GB	P1080S SCSI-2	10MS	3.5X1"	749
1.2GB	P1225S SCSI-2	10MS	3.5"	845
1.6GB	P1800S SCSI-2	10MS	3.5"	965

FUJITSU

FACTORY NEW – 5 YEAR WARRANTY

IDE				
520MB	M2624T	12MS	3.5"	399
SCSI				
1.2GB	M2694ESA	10MS	3.5"	745
2.1GB	M2654S	12MS	FH	1345

Maxtor

FACTORY NEW – 2 YEAR WARRANTY

IDE				
130MB	7131A	14MS	3.5X1"	179
170MB	7171A	13MS	3.5X1"	185
273MB	7273A	12MS	3.5X1"	249
345MB	7345A	12MS	3.5"	245
540MB	7546A	10MS	3.5X1"	355
SCSI				
273MB	7273S	15MS	3.5X1"	CALL
290MB	7290S	14MS	3.5X1"	289
345MB	7345S SCSI-2	12MS	3.5"	319
540MB	MXT540S	8MS	3.5X1"	459
1.2GB	MXT1240S SCSI-2	8MS	3.5"	1199

TOSHIBA

1 YEAR WARRANTY ON 2.5"

SUPERFAST SCSI 2			
126MB	IDE MK1522FC	2.5"	$275
213MB	IDE MK2224FC	2.5"	375
213MB	SCSI MK2224FB	2.5"	399
340MB	IDE MK2326FC	2.5"	549
524MB	IDE MK2428FC	2.5"	775

HEWLETT PACKARD

FACTORY NEW – 5 YEAR WARRANTY

SCSI				
1.0GB	C2247	10MS	3.5"	749
2.1GB	C2490	8.9MS	3.5"	1350

digital

FACTORY NEW – FULL WARRANTY
DISK DRIVES FOR POWER USERS

SCSI II				
535MB	DSP3053L	8.5MS	3.5X1"	620
1.0GB	DSP3107L	8.5MS	3.5X1"	770
1.0GB	VP3107	9MS	3.5X1"	CALL
1.3GB	DSP3133L	9.5MS	3.5X1"	1040
1.6GB	DSP3160	9.5MS	3.5"	1065
2.1GB	DSP3210	9MS	3.5"	1370
2.2GB	VP3215	9MS	3.5X1"	CALL
3.5GB	DSP5350	12MS	FH	2205
4.0GB	DSP5400	12MS	FH	2452
4.3GB	SP3430	9MS	3.5"	CALL

ALL CREDIT CARDS ARE VERIFIED FOR FRAUDULANT USE. HOURS: MON-FRI 9:30-6:30 SAT 10:00-3:00. ORDERS FROM ANYWHERE IN THE USA OR CANADA. CALL FOR CURRENT PRICES AND VOLUME DISCOUNTS. PRICES AND AVAILABILITY SUBJECT TO CHANGE. ORDER LINES OPEN 8 DAYS. MINIMUM ORDER $50.00. USA SHIPPING AND HANDLING: AIR $12.00 - AIR OVERNIGHT $18.00 - COD ADD $4.00. PA RESIDENTS ADD 7% SALES TAX. PREPAID ORDERS CALL FOR CONFIRMATION. ALL RETURNS REQUIRE RMA# AND ORIGINAL INVOICE. CANCELLED ORDERS AND RETURNS FOR CREDIT SUBJECT TO 25% RESTOCKING CHARGE. RETURNED MERCHANDISE MUST BE IN NEW CONDITION AND RECEIVED WITHIN 14 DAYS FROM INVOICE DATE. SORRY, NO REFUNDS AFTER 14 DAYS. SHIPPING AND HANDLING CHARGES NOT REFUNDABLE. INTERNATIONAL ORDERS WELCOME - APO - FPO — ORDERS WELCOME. P.O.'S ACCEPTED FROM GOVERNMENT AGENCIES – UNIVERSITIES – FORTUNE 2000 COMPANIES – SUBJECT TO APPROVAL. ALL MEMORY PRODUCTS ARE THIRD PARTY. ALL TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. ALL MEMORY PRODUCTS ARE 100% GUARANTEED AND COME WITH LIFETIME WARRANTY EXCEPT 30 DAY WARRANTY ON CPUS AND ONE YEAR WARRANTY ON MOTHER BOARDS. ALL HARD DRIVES ARE MANUFACTURERS WARRANTY ONLY.

FOR MEMORY PRODUCTS NOT LISTED CALL FOR PRICES AND AVAILABILITY

CALL FOR LATEST SUPER PRICES **1-800-457-6937**

WORLDWIDE TECHNOLOGIES 437 Chestnut Street, Philadelphia, PA 19106.

INTERNATIONAL ORDERS WELCOME

- 215-922-0050 International Order Line
- 215-922-4640 Technical Support
- 215-922-0116 FAX • Domestic • International
- 800-457-6937 Order Line – TOLL FREE
- 800-636-6792 Government • Universities • Fortune 2000

Circle 238 on reader service card

LYCO SHOPPING CENTER

DOT MATRIX PRINTERS

PANASONIC

KX-P1150 9-Pin 240 2162 cps 2-yr warranty $126.95

KX-P2023 24-pin 240 80 cps 2-yr warranty wide carriage $169.95

KX-P2130 24-pin 250 cps maximum speed $197.95

KX-P2135 24-pin 250 cps Maximum speed Color $234.95

KX-P3624 24-pin 300 100 cps 2-yr warranty $375.95

EPSON®

LX-300 9-pin 264 53 cps ... $165.95

FX-870 9-pin 380 68 cps 2-yr warranty $267.95
Wide carriage version FX-1170 $349.95

LQ-570+ 24-pin 337 112 cps 2-yr warranty $238.95
Wide carriage LQ-1070+ ... $359.95

LQ-870 24-pin 360 138 2-yr warranty $439.95
Wide carriage version LQ-1170 $598.95

LQ-2550 24-pin 400 133 cps 1-yr warranty Color $899.95

OKIDATA

184 9-pin 300 50 cps 1-yr warranty $210.95

320 9-pin 300 63 cps 1-yr warranty $289.95
Wide carriage version 321... $415.95

520 9-pin 430 80 cps 1-yr warranty $348.95
Wide carriage version 521... $465.95

380 24-pin 240 63 cps 2-yr warranty $204.95

590 24-pin 450 120 cps 2-yr warranty $415.95
Wide carriage version 591... $565.95

395C 24-pin 607 162 cps 1-yr warranty $999.95

3410 24-pin 550 cps HSO 1-yr warranty $1179.95

MANNESMANN TALLY

MT150 24-pin 360 120 cps 1 year warranty $589.95

MT360 2T24-pin 540 120 cps 1-yr warranty wide carriage $1999.95

MT645 Line printer 450 210 LPM 1-yr warranty $4499.95

MT661 Line printer 800 LPM 1-yr warranty $6499.95*

MT691 Line printer 1400 1500 LPM 1 year warranty $6999.95

T6082 Line printer 900 LPM 50 OBA world's most quiet line printer . $CALL

T6092 Line printer 1400 LPM 52 OBA most quiet printer in its class.. $CALL

*Price includes FREE delivery in mainland U.S.A

HARD DRIVES

SEAGATE

3½" 1 Inch High IDE/AT:

ST-3290A 263M8 16MS .. $209.95
ST-3391A 341M8 14MS .. $234.95
ST-3491A 428M8 14MS .. $245.95
ST-3655A 528M8 12MS .. $329.95
ST-31200N 1050M8 9MS ... $679.95

3½" Half Heights Fast SCSI-2:

ST-12550N 2139MB 8MS $1539.95
ST-12400N 2148M8 8MS $1349.95
ST-42400N 2129MB 9MS $1499.95
ST-43400N 2912M8 10MS $1899.95

MAXTOR

3½" 1 Inch High IDE/AT:

7245A 245MB 15MS $199.95
7273A 273MB 12MS ..... NEW
7345A 345MB 14MS $245.95
7405A 405MB 12MS $245.95
7546A 546MB 12MS $319.95

MICROPOLIS

3½" Half Heights:

2210A 976MB 10MS $699.95
4410 1050MB 10MS $675.95
2217 1750M8 10MS $939.95

WESTERN DIGITAL

Caviar IDE/AT Series:

WO 2340 341MB 13MS .. $219.95
WD 2420 425MB 13MS .. $239.95
WO 2540 540MB 13MS .. $339.95

TAPE BACK-UPS

Internal

COLORADO

DJ-10 Jumbo 120 ..... $98.95+
► 120MB capacity ► Under 20 minutes for 40MB back-up (typical) ► Dual data rates 250 & 500 kb/s ► Qic 40 industry standard recording format

DJ-20 Jumbo 250 ..... $149.95*
► 250MB capacity ► Under 10 minutes for 40MB back-up (typical) ► Dual data rates 500b/s 1MB/s ► Reads DJ-10 tapes ► Qic 80 industry standard format

CONNER

C250MQ $139.95
► 250MB capacity ► Reads Qic 40 & 80 ► 2-yr warranty

*Quantities Limited
+External versions available

External Parallel Port (connects to your printer port.)

COLORADO

JT-10 Trakker 120 ..... $189.95
► 120MB back-up capacity with data compression ► Qic 40 industry standard format ► 4.8MB per minute speed (typical)

JT-20 Trakker 250 ..... $299.95
► 250MB back-up speed capacity with data compression ► Qic 80 industry standard format ► 9.5MB per minute back-up speed (typical)

CONNER

C250MOP $295.95*
► Connects through your existing parallel port ► 250MB back-up capacity with data compression ► Qic 80 industry standard format ► 9.5MB per minute back-up speed ► 2-yr warranty

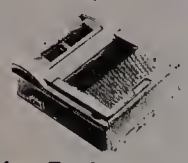
*Quantites Limited

WHY LYCO COMPUTER:

Knowledgeable people Our marketing staff is well educated and receives continuous formal training by the manufacturers whose products we sell. The sales lines are open Mon - Fri 9 -9 and on Sat from 10 - 6 EST **Technical and service support** Our customer service staff receives additional training and is staffed by authorized repair technicians If your problem can t be solved over the phone, we will service in and out of warranty products regardless of where you made your purchase Our Customer Service lines are open Mon - Fri from 9 - 5 EST **Buy with confidence** Our product line enjoys "Name brand recognition." We back all of our manufacturer's warranties in accordance with the manufacturer s stated terms We sell strictly new merchandise, therefore we can't offer free trial periods since the manufacturers don t accept used goods A note to the wise -be wary of companies offering money-back guarantees. Those folks can t return used products to the manufacturer either and usually resell them. At Lyco we want your long term business and confidence. **We accept all major credit cards** and C O D. orders through UPS. Prepaid cash mail orders over $50 are shipped free in the continental U S. For orders under $50 please add $3 for freight Mail orders prepaid by certified check or money order are shipped immediately Personal and company checks require a 4 week clearing period prior to shipping We only charge sales tax on deliveries in PA For APO FPO, and international orders add $5 plus 3 percent for priority mail Advertised prices and availability are subject to change. Return restrictions apply Not responsible for typographical errors. **Purchase orders are accepted** from educational institutions and qualified corporations with good credit

OKIDATA

OL400e LED
Best buy at 4PPM



Key Features
► 4PPM
► 512K memory W/EMM
► 300 X 300 dpi
► 44 resident fonts
► 5-yr printhead warranty

$459.95* *Quantities Limited

OL410e LED
600 DPI Class

Key Features
► 4PPM W/32-bit RISC processor
► 2MB with EMM
► 600 DPI Class
► 5-yr printhead warranty

$599.95*

Panasonic Office Automation

KX-P4400
Affordable Laser

Key Features
► 4PPM LED
► 300 X 300 dpi
► 512K memory
► 1-yr warranty

$410.95*

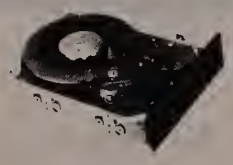
KX-P4410
Quality Laser Output

Key Features
► 5PPM
► 300 X 300 dpi
► 1MB memory
► 1-yr warranty

$449.95

*After $50 rebate & less $15 value of free toner. Rebate ends 9/30/94

Seagate / Maxtor



Key Features
► Model ST-31200N
► 3½" 1 inch high
► 1050MB
► IDE/AT
► 9 msec seek time
► Priced at 65¢ a meg

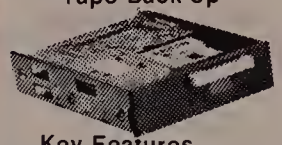
$679.95

Key Features
► Model 7546A
► 3½" 1 inch high
► 546MB
► IDE/AT
► 12 msec seek time
► Priced at 58 ¢ a meg

$319.95

COLORADO MEMORY SYSTEMS INC

Tape Back-Up



Key Features
► Model DJ-20
► 250MB back-up capacity
► Under 10 min. for 40MB back-up
► Qic 80 industry standard format

$149.95*
*Quantities Limited

ZOOM
Voice Modem

Key Features
► Model 14.4 Voice Internal
► Voice storage/playback
► Voice mail
► Fax modem
► Data modem

$138.95

MONITORS

CTX

6468A 14" 28 SVGA $239.95
1451 GM ES .28 SVGA .. $269.95/$259.95
1462 GM ES .28 SVGA .. $289.95/$285.95
1562 GM ES .28 SVGA .. $338.95/$335.95
1585 GM ES .28 SVGA $339.95
1785 GM 27 SVGA $689.95

If you don't see your product, please call.

LAPTOPS

IBM®

ThinkPad® 755C ..... IN STOCK!

EPSON®

ActionNote 4SLC2-50 210MB... $1589.95
ActionNote 500C210MB ..... $CALL
ActionNote 700 210MB $1879.95
ActionNote 700C 210M8 Color . $2499.95
ActionNote 700CX 210M8 Color $3159.95

INKJET PRINTERS

EPSON®

Stylus 400 360 X 360 dpi 120 cps LQ new microwave technology.... $242.95

Stylus 800+ 360 X 360 dpi 250 cps LQ nwe microwave technology.... $269.95

Stylus 1000 360 X 360 dpi 250 cps LQ 100 sheet paper tray wide carriage $CALL

Stylus Color 720 dpi new microwave technology $559.95

CANON

BJ-100 360 X 360 dpi 140 cps draft 100 page sheet feeder $199.95*

BJ-200E 360 X 360 dpi 248 cps draft 100 pg.sheet feeder $245.95*

BJC-600 Color 360 X 360 dpi 240 cps draft 100 pg.sheet auto feeder $535.95*
*After rebate. Rebate ends 8/31/94

THERMAL PRINTERS

MANNESMANN TALLY

Mobile Writer mono 300 X 300 dpi portable $749.95

Mobile Writer PS mono 300 X 300 dpi Post Script portable 6PPM $825.95

FARGO

Primera Color $679.95
Primera Color Pro Photo quality output 600 X 300 dpi 16.7 million colors dual dye sulimination 1 year warranty $CALL

LASER PRINTERS

CANON

LBP-430 4PPM 300 dpi 1M8 HPIIP emulation 1-yr warranty..... $549.95*

LBP-860 8PPM 600 dpi 2MB 2-yr warranty $1225.95*
*After rebate. Rebate ends 8/31/94

HARD DRIVES

CONNER

3½" Half Heights IDE/AT:

CFS 210A 213M8 14MS... $187.95
CFS 420A 423MB 14MS... $239.95
CPA 540A 541MB 12MS .. $329.95
CFA 810 811M8 12MS... $499.95
CFA 1080A 1080M8 10.5MS. $609.95

FLOPPY DRIVES

TEAC

5¼" 1.2MB FO-5G $49.95
3½" 1.44MB FO-235HF $42.95*
3½" + 5¼" dual floppy FD-505 $105.95
*Universal Installation kit included

MULTIMEDIA KITS

MEDIA VISION

Reno ..... $CALL
Family Deluxe $329.95
Pro 16/III Triple Speed..... $629.95

CREATIVE LABS

Omni CD $199.95
Discovery CD8 ..... $274.95
Oiscovery CO/16 ..... $304.95
Edutainment CD 16 ..... $399.95
Game Blaster $375.95
Digital 38 triple speed $699.95

CORPORATE NET ACCOUNTS AVAILABLE.

ATTENTION EDUCATIONAL INSTITUTIONS

If your'e not currently using our educational program, please call one of our representatives for details.

LASER PRINTERS

OKIDATA

OL400e LED 4PPM 300 X 300 dpi 512K memory HPIIP emulation 5-yr printhead warranty $469.95*

OL410e LED 4PPM 600 X 600 dpi 2MB memory HPIII emulation 5-yr printhead warranty $599.95*

OL810 LED 8PPM 300 X 300 dpi 1MB memory HPII emulation 5-yr printhead warranty $889.95

OL830+ LED 8PPM 300 X 300 dpi 2MB memory HPII emulation 5-yr printhead warranty $1045.95

OL850 LED 8PPM 300 X 300 dpi 2MB memory HPII emulation Post Script 5-yr warranty $1199.95
*Quantities Limited

EPSON®

ActionLaser 1500 6PPM 300 X 300 dpi 1M8 memory HPIII emulation 2-yr warranty $639.95

ActionLaser 1600 6PPM 600 X 600 dpi 2-yr warranty $929.95

MANNESMANN TALLY

MT9008 8PPM 600 X 600 dpi 2MB memory $999.95

PANASONIC

KX-P4400 4PPM 300 X 300 dpi 512K memory HPIIP emulation 1-yr warranty ..... $410.95✓

KX-P4410 5PPM 300 X 300 dpi 1MB memory HP LJ-II (PCL-) emulation 1-yr warranty ..... $449.95✓

KX-P4430 5PPM 300 X 300 dpi 1MB memory HPIII emulation 1-yr warranty $619.95

✓ After $50 rebate and less $15 value of free toner.
Rebate ends 9/30/94

SCANNERS

EPSON®

ActionScanning System PC .. $769.95
ES-800C $1099.95
ES-8000 Pro PC Color scanner $1199.95

FAX MODEMS

GVC

FM 96-48/24H internal with 9600 send 4800 receive fax modem $42.95
FM 144i Internal $89.95
FM 144/144V External $139.95

U.S. ROBOTICS

Sportster Fax 14.4 INT $112.95
Sportster Fax 14.4 EXT $134.95
World port Fax 14.4 PMCIA .. $189.95

ZOOM

14.4 Fax Modem Int./Ext. $79.95/$115.95
14.4 Voice/Fax/Modem INT ... $138.95
14.4 Voice/Fax/modem EXT ... $168.95
28.8 Fax Modem Int. $189.95

SOUND CARDS

CREATIVE LABS

Sound blaster value edition .. $54.95
Sound blaster pro value edition $75.95
Sound blaster 16 value edition $99.95
Sound blaster 16 MCD $134.95
Sound blaster 16 MCD ASP . $164.95
Sound blaster 16 SCSI II $164.95
Sound blaster 16 SCSI II ASP $194.95

MEDIA VISION

Pro audio 16 with SCSI $119.95
Pro audio studio 16 with SCSI $152.95

IBM COMPUTERS

IBM® Computers
Occupation & Saftey & Health Administration Regulations for LABOR

486 SX/25 170MB DOS/Windows VESA $1199.95
486 SX/25 245MB DOS/Windows VESA $1369.95
486 SX/33 170MB DOS/Windows VESA $1399.95
486 DX/33 212MB DOS/Windows VESA $1599.95
486 DX/33 340MB DOS/Windows VESA $1779.95
486 DX2/66 212MB DOS/Windows VESA $2079.95
486 DX2/66 340MB DOS/Windoes VESA $2239.95
(NEW) 755C CS ..... $CALL

Over 50 models available to suite your individual needs.
OS2 versions & Tower versions available...$CALL

IBM, OS2 & ThinkPad are registered trademerks of International Business Machines.

Lyco Computer 800-233-8760

P.O. Box 5088 Jersey Shore, PA 17740
Customer Service (717)-494-1670
(717)-494-1030 Fax: (717)-494-1441

Circle 126 on reader service card

OURS.

NO RISK

- 45 day money back guarantee
- We configure, build and test your system the way you want it
- Ships in 72 hours
- Award winning tech support and service

THEIRS.

RISK

- 30 day money back guarantee
- You take what they have, test it yourself and hope it works
- Ships in 240 hours, maybe
- Good luck!

"SIX YEARS AND GOING STRONG"

" ... Service and support was solid, and the company offers strong policies. If you're looking for all-around solid performer at a good price, the MIS should make your short list."

- PC World, "Best Buy", May 1993

" ... MIS provided excellent service & support plus key components to ensure top-notch performance for its PROMIS SL-66."

- PC World, "Best Buy, Best Performance", December 1993

MICROSOFT WINDOWS READY-TO-RUN

intel inside

yes NetWare Tested and Approved

Call 1-800-733-9188

Fax 510-226-0230

We offer various models using Intel DX and Pentium family processors up to 100 MHz.

The Intel Inside logo is a trademark of Intel corporation.
The Energy Star emblem does not represent EPA endorsement of any product or service.
All other names and logos used here are trademarks or registered trademarks of their respective companies.
45 day money back does not include return freight or original shipping charge.

MIS

Circle 172 on reader service card

RUSH POSTAGE-PAID CARD FOR YOUR FREE CATALOG!

Every NRI course features practical, hands-on training with state-of-the-art equipment you keep. Only NRI gives you the training and the equipment for career advancement, part-time earnings, or even a business of your own.

Name *(Please Print)* Age

Street *(No P.O. Box numbers please)*

City State Zip

Accredited Member National Home Study Council 5497-0994

Card CP

For career courses approved under G.I. Bill, ❑ check for details

☑ CHECK ONE ONLY

Please send my FREE catalog on NRI training in:

- ❑ **Computer Programming**
- ❑ Microcomputer Servicing
- ❑ Programming in C++ with Windows
- ❑ PC Applications Specialist
- ❑ Desktop Publishing & Design
- ❑ Interior Design
- ❑ TV/ Video/Audio Servicing
- ❑ Industrial Electronics & Robotics
- ❑ Basic Electronics
- ❑ Building Construction & Remodeling
- ❑ Home Inspection
- ❑ Air Conditioning, Heating & Refrigeration
- ❑ Locksmithing
- ❑ Automotive Servicing
- ❑ Paralegal
- ❑ Fiction/Nonfiction Writing
- ❑ Bookkeeping and Accounting
- ❑ Computer-Aided Drafting
- ❑ Database Management
- ❑ Multimedia Specialist

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20078-3543

Be a computer programmer!

Only NRI gives you hands-on training with a 486sx Multimedia PC:

■ A 486sx computer with Super VGA color monitor, 200 meg hard drive ■ CD-ROM drive and sound card ■ Windows ■ Visual Basic ■ Power C ■ QBasic ■ MS-DOS 6.2

Only NRI at-home training gives you real-world programming skills in three in-demand languages: QBasic, C, and Visual Basic, today's hot new language designed for writing popular Windows applications. Best of all, you get hands-on training with a powerful Multimedia PC, featuring an Intel-based 486sx computer, Super VGA color monitor, 200 meg hard drive, CD-ROM drive with sound card, and professional software you keep!

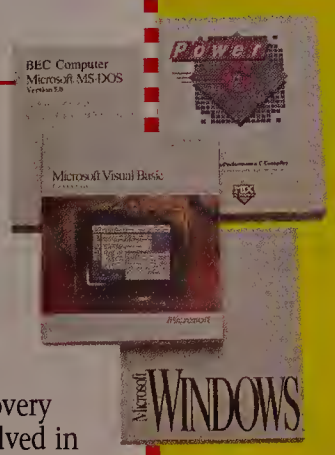
NRI, the leader in at-home computer training, shows you how to take advantage of today's newest programming opportunities

Get in on the ground floor of computer programming, one of today's fastest-growing career fields. The Bureau of Labor Statistics forecasts that job opportunities for programmers will increase *much* faster than average over the next 10 years, with as many as 400,000 *new* jobs opening up by 2005.

And the fastest-growing segment of programming jobs will be PC programming, fueled by the phenomenal popularity of Windows, the efficient power of C, and the rise of exciting new languages like QBasic and Visual Basic.

Now, with NRI at-home training, you can get the new skills you need to build a top-paying career — even a full- or part-time business of your own — in this high-growth, high-opportunity field.

Get hands-on experience with today's programming tools: a powerful 486sx multimedia computer, color monitor, 200 meg hard drive, CD-ROM drive, Windows, Visual Basic, and more!



Right from the start, NRI's unique Discovery Learning Method gets you actively involved in the challenge of real-world programming. Step by step, you learn to create the kinds of full-featured, powerful programs today's employers and clients demand...even multimedia programs!

Only NRI gives you first-hand programming experience with a state-of-the-art Intel-based 486sx computer system, complete with Super VGA color monitor, 200 meg hard disk drive, 5 full megabytes of RAM, CD-ROM drive and sound card, 1.44 meg 3.5" floppy drive, mouse, and more — an MPC system that's yours to train with and keep!

Plus you explore the extraordinary capabilities of three in-demand programming languages. You learn to design, code, run, debug, and document programs in QBasic, C, and Visual Basic. Best of all, since Visual Basic is specifically designed for creating Windows applications, you learn to generate fully functioning Windows programs, complete with text boxes, command buttons, and other sophisticated graphical interface elements.

No previous experience necessary

Train with NRI, and immediately start getting the money-making job skills you need to be a computer programmer — no matter what your previous background.

NRI's step-by-step lessons and hands-on programming projects help you first master the design concepts used every day by successful PC programmers. Then, with the support of your experienced NRI instructor, you quickly move on to learn programming in three of today's hottest languages.

By the time you complete your course, you have a clear understanding of programming methods, languages, and techniques... and you're ready to handle any programming task with confidence.

Send today for your FREE catalog

See how NRI at-home training gives you the programming know-how, the computer, and the software you need to get started in this top-paying field. Send today for your FREE catalog!

If the coupon is missing, write to us at the NRI School of Computer Programming, McGraw-Hill Continuing Education Center, 4401 Connecticut Avenue, NW, Washington, DC 20008.

IBM is a registered trademark of the IBM Corporation. Windows, QBasic, and Visual Basic are trademarks of Microsoft Corporation. Intel Inside logo is a registered trademark of Intel, Inc.

FREE CATALOG! CALL 1-800-321-4634

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW, Washington, DC 20008

❑ For career courses approved under GI Bill, check for details

☑ **Check one FREE catalog only**

❑ **COMPUTER PROGRAMMING**
- ❑ PC Applications Specialist
- ❑ Programming in C++ with Windows

Other Computer Career Courses
- ❑ Microcomputer Servicing
- ❑ Desktop Publishing
- ❑ Bookkeeping and Accounting
- ❑ Multimedia Specialist

Name (please print) Age

Address

City/State/Zip

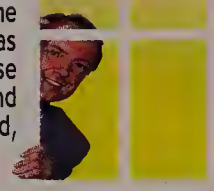
Accredited Member, National Home Study Council

5497-0994

Software Training Videos

LEARN FROM THE EXPERTS

Windows® 3.1



Tom Sheldon guides you through the basics of Windows operation, as well as demonstrating how to use the many powerful applications and accessories such as Notepad, Paintbrush, Write, and more.

Beginning Windows 3.1 $49.95
Created specifically for new users, Tom Sheldon guides you through the basics of Windows operation.

Windows 3.1 Applications $49.95
Picking up where Beginning Windows left off, Tom demonstrates how to use the many powerful applications of 3.1.

Windows 3.1 Adv. Tips & Tricks $49.95
Learn about creating macros, changing PIF files, object linking and embedding, and much more.

Optimizing Windows 3.1 $49.95
This tape will help you improve Windows operation on your system. Learn about Windows memory requirements and how to evaluate your computer's performance.

America's Best-selling Windows Videos

Combination Special *4 tapes* $159.95

Ami Pro®

New Videos!

Daniel Fingerman, MIT graduate and author of the original best-seller *Ami Pro Made Easy*, will lead you through clear, simple instructions to build your computer competence and proficiency on Ami Pro.

Beginning Ami Pro $49.95
Learn to create, edit, save,retrieve, and print various types of documents. You'll begin investigating the Ami Pro menu options and SmartIcons and learn to adjust page layouts to meet your word processing needs.

Intermediate Ami Pro $49.95
In this tape you will learn to use find and replace, spell check, and other text editing tools. You'll learn to use both the powerful styles and tables features and more.

Advanced Ami Pro $49.95
The final tape in this series introduces you to frames, to macros, and to a variety of methods available to you for customizing Ami Pro to meet your needs more easily.

Combination Special *3 tapes* $129.95

WordPerfect® for Windows

Learning WordPerfect couldn't be easier! Karen Acerson, Carolyn Dillon, Ray Young and Jake Nieuwland are the expert instructors on this powerful software.

Beginning WP 6.x for Windows $49.95
You will learn to create, edit, save and print basic business documents, as well as streamline your word processing.

Interm. WP 6.x for Windows $49.95
Learn how to search and replace, justify, create footnotes, special characters, macros and more.

Adv. WP 6.x for Windows part 1 $49.95
You'll learn the process behind creating columns, tables, graphs, styles and more.

Adv. WP 6.x for Windows part 2 $49.95
Learn about merge, customizing button bars, sorting, outlining, faxing, bookmark, indexing and other techniques.

Combination Special *4 tapes* $159.95

Other WordPerfect/Win Videos
Macro Magic, Perfecting the Office, Essentials of Desktop Publishing.

Also available in DOS 6.x

WordPerfect Magazine 1992 Readers Choice

1991-1994 WordPerfect Magazine & WordPerfect for Windows Magazine Reader's Choice Award

Word® for Windows 6.0

In this series of videos, Tom Badgett, a successful computer book author, including *Word for Windows*, will help you understand the many features & functions of Word. From beginning, to intermediate, to advanced, these tapes are a must if you are using Word.

Beginning Word for Window $49.95
Learn about menus, tool bar, defaults, and other basics to help you create letter memos, and other documents.

Intermediate Word/Windows $49.9
This tape will show you how to search for, find & repla text, format paragraphs, use tables & columns, & more.

Advanced Word for Windows $49.9
Learn about linking and embedding, outlining, using macr creating lists, using frames, importing graphics, & more.

Combination Special *3 tapes* $129.95

Also available Word for DOS series

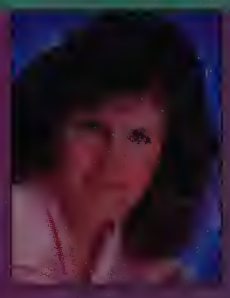
Voted #1 Training Videos Again!

Order your training videos today!

1-800-937-3279 ext 10

Call, Write, or FAX for a FREE Catalog!

All company and/or product names are trademarks or registered trademarks of their respective holders

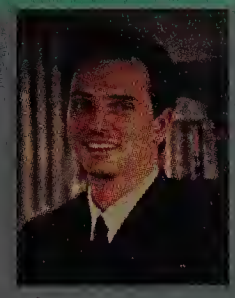


Karen Acerson
author of *WordPerfect: The Complete Reference* and *WordPerfect: From 5.0 to 5.1.*

Tom Sheldon
author of *Windows 3 Made Easy* and *NetWare 4: The Complete Reference.*

Judd Robbins
author of over 21 technical books including the recent best-seller *Mastering DOS 6.*

Daniel Will-Harris
author of *WordPerfect: Desktop Publishing in Style* and *Ventura Tips & Tricks.*



Tim Gendreau
Certified NetWare Level II instructor has taught hundreds of professionals.

These nationally recognized instructors and best selling authors will help you learn WordPerfect, Lotus, Windows, and other popular software in a few short hours. Just watch TV — no complicated manuals, no expensive and inconvenient classes, and your entire office learns for one low price. Over 500,000 business, government, and educational professionals have used LearnKey's "Teach Me How" videos to help them master their computer. LearnKey offers the best computer training by featuring the absolute best teachers. *SATISFACTION GUARANTEED!*

Desktop Publishing

CorelDRAW Series (2 Tapes) **$99.95**
In this series Design Expert, Daniel Will-Harris will lead you step-by-step through features like creating logos, backgrounds with Photo Paint, using layers, mosaics, guidelines, production, color separations, drop shadows, outlines, blends, neon, emboss and much, much more. 2 Tapes

Harvard Graphics Series (2 Tapes) **$99.95**
This series is taught by Harvard Graphics specialist Mike McClure. His expert instruction will teach you the ins and outs of this graphic program including how to create bullet, organizational, pie and bar charts, slide shows, 3-D effects, color management, dropping in scanned images, gradient fills, importing data, canvas tool, using hyper show quick F/X, OLE and much more. There are versions for DOS and Windows.

WordPerfect Presentations Series (2 Tapes) **$99.95**
Ray Young and Kent Hansen will introduce you to the essential drawing and editing functions of Presentations. You'll learn how to create slide shows, produce business cards and logos, create posters and charts, manipulate images, create masks, customize and create button bars, macros and more.

Quattro Pro®

New Videos!

Michael Lunsford, author, lecturer, consultant and software developer is an acknowledged expert on spreadsheets and macros. He will lead you through this powerful spreadsheet software making you the expert in your office.

Beginning Quattro Pro **$49.95**
You'll learn how to enter data, adjust the look of the worksheet, format cells, open files, graphing, printing and more.

Intermediate Quattro Pro **$49.95**
Learn to insert files, group and consolidate spreadsheets, make changes to group pages, use the expert buttons, data commands, and more.

Advanced Quattro Pro **$49.95**
Become proficient on named ranges, macros, creating speed buttons, dialog boxes, custom speed bars, slide shows and more.

Combination Special 3 tapes **$129.95**

Lotus 123®

Judd Robbins, author, & lecturer, teaches beginning, intermediate, and advanced features of this popular and powerful software. DOS or Win

Beginning Lotus 123 **$49.95**
Learn about updating and enhancing spreadsheets, using cell ranges, perform sophisticated calculations, and more.

Intermediate Lotus 123 **$49.95**
This tape teaches about add-in programs, WYSIWYG, BSOLVER, AUDITOR, MACROMGR, VIEWER, and more.

Advanced Lotus 123 **$49.95**
Learn about presentation quality graphs, file linking, macros, database management, and much more.

Combination Special 3 tapes **$129.95**

Excel® for Windows

New Videos!

Basic instruction of Excel 5.0 for Windows is taught by Reed Jacobson, a certified Microsoft "Partner", and author of *Excel Trade Secrets for Windows.*

Beginning Excel/Windows **$49.95**
This tape will help the user understand the basic operation of this fabulous spreadsheet/database program.

Intermediate Excel/Windows **$49.95**
Learn about creating and changing charts, adding & formatting text, adding a legend, database analysis, and more.

Advanced Excel/Windows **$49.95**
This tape teaches about using macros, linking worksheets, consolidation, and much more.

Combination Special 3 tapes **$129.95**

More Great Videos

FoxPro for Windows Series
WordPerfect Legal Series (Win or DOS)
WordPerfect Office Series (Win or DOS)
Novell NetWare Administration Series
AutoCAD Series
LANtastic Series
DOS 6.x Series
OS/2 Series
Introduction to PowerPoint

3 EASY WAYS TO ORDER

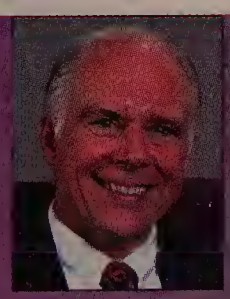
Payment:
Authorized P.O., Business Checks, and Money Orders. Allow 2 weeks for personal checks to clear. Utah residents add 6.25% sales tax.

U.S. Shipping & Handling:

Video Tapes	Ground Shipping	2 day Shipping	Overnite Shipping
1-4	$5.00	$7.00	$13.50
5 & over add	$.50 per tape	$1.00 per tape	$1.50 per tape

FAX or mail orders to:
LearnKey, Inc.
93 S. MountainWay Dr. Rm.10
Orem, UT 84058

Phone 801-224-8210
FAX 801-224-8211



Tom Badgett
author of *Word for Windows, Word for Windows,* and *Word for Macintosh.*

Mike McClure
Harvard Graphics Expert Designer and Trainer.

Reed Jacobson
Certified Microsoft "Partner", and author of *Excel Trade Secrets for Windows.*

Ray Young & Kent Hansen
Team up to teach WordPerfect Presentations

30 Day Money-Back Guarantee!
1-800-937-3279 ext 10

Circle 206 on reader service card

Software Training Videos

WE WILL TRY TO MATCH OR BEAT ANY ADVERTISED PRICE. CALL FOR LATEST PRICING!!

WE ACCEPT PO'S FROM QUALIFIED FIRMS

MEMORY

NO SURCHARGE FOR MC, VISA AE & DISCOVER

CACHE MEMORY

	12NS	15NS	20NS	25NS
8Kx8	–	6.50	6.00	5.50
32Kx8	19.00	9.00	8.00	7.00
64Kx1	–	11.00	9.00	8.00
64Kx4	–	11.00	9.00	8.00
16Kx4	–	8.00	7.00	6.00
128Kx8	–	–	39.00	29.00

Individual D-RAM Chips

MEMORY FOR IBM & APPLE

	50NS	60NS	70NS	80NS	100NS
1Megx1	–	6.85	6.45	5.95	4.95
1Megx4	–	59.00	55.00	54.00	–
1Megx4 (Zip Pk)	–	24.00	22.00	21.00	–
256x4(Page Dip)	–	7.25	6.75	6.50	5.95
256 4(Static Dip)	–	–	9.95	–	–
256x4(Page Zip)	–	9.25	9.00	8.95	–
256x4(Video Zip)	–	–	12.95	11.95	9.95
256 x1	–	3.25	2.95	2.75	2.25
64x4	–	–	–	3.75	–
64x1	–	–	–	–	2.00
256x16 SOJ	–	–	–	–	–
256x16 Video Zip	–	–	CALL	–	–

Dual write enable Pac. Bell

INTEL Math Chips

8087	39.00
8087-2	45.00
8087-1	79.00
80287-XL	49.00
80387-16 DX	39.00
80387-20 DX	44.00
80387-DX (Does All)	74.00
80487-SX (Does All)	299.00
Intel SX (Does All)	69.00
Intel SL Mobil	69.00
Intel 16SX	39.00
Intel 20SX	49.00

Call for overdrive chips

AMBRA

Ambra Pentium-60	4/8/16 Meg	175.00/339.00/699.00
Ambra NC 425SL	2/4/8 Meg	109.00/209.00/449.00
Ambra N Series	4/8/12/16 Meg	189.00/379.00/569.00/829.00
Ambra SN Series	4/16 Meg	189.00/829.00
Ambra Sprinta SLC II	2/8 Meg	Call/Call

CYRIX DRx² 386 to 486 Upgrade

Clock Doubler

- Single chip upgrade solution
- Clock doubling technology
- Compatible with industry standard 386DX CPU socket
- Compatible with DOS, Windows, 3.X, OS/2 1.3 and 2.x
- Uses industry standard math chip
- Easy to install—about 15 minutes

The Cyrix upgrade runs at twice the speed of your original 386 microprocessor combined with a 1K on-chip cache you will enjoy a performance boost of 100% and more. Ideal for any DOS, Windows or OS/2 application which requires a large amount of microprocessor horsepower.

CX486 ORx²-16/32	269.00
CX486 ORx²-20/40	279.00
CX486 DRx²-25/50	319.00
CX486 DRx²-33/66	359.00
CX486 SRX2 16/32	249.00
CX486 SRX2 20/40	249.00
CX486 SRX2 25/50	279.00

SIMM MODULES (Add $5.00 for SIPP)

	40NS	50NS	60NS	70NS	80NS	100NS
1Meg x 9 (3 chip)	–	49.00	44.00	43.00	41.50	–
1Meg x 9 (9 chip)	–	–	46.00	45.00	43.00	39.00
4Meg x 9	–	–	162.00	158.00	149.00	–
16Meg x 9 (9 chip)	–	–	–	679.00	–	–

72 PIN SIMMS (EISA)

256 x 36	–	–	–	–	59.00	–
512 x 36	–	–	–	96.00	94.00	–
1 meg x 36	–	–	184.00	174.00	174.00	–
2 x 36	–	–	359.00	339.00	339.00	–
4 x 36 (9 chip)	–	–	689.00	669.00	669.00	–
8 x 36	–	–	1459.00	1419.00	–	–
16 x 36	–	–	2806.00	2745.00	–	–
1 x 32	–	–	174.00	164.00	–	–
2 x 32	–	–	339.00	319.00	–	–
4 x 32	–	–	649.00	629.00	–	–

CYRIX FASMATH PROCESSOR

Programs executed up to 3X faster • Plug & object code compat. w/Intel

83D87-40MHz – **79.00** 83D87-33MHz – **59.00** 83S87-25SX Ver. – **69.00**
83S87-33SX – **79.00** PC Week™ rated #1 over all math chips

5 Year Warranty • "All Downward Compatible"

AST MEMORY

MODEL	AMT. UPGRADED	AST PART #		PRICE
Bravo LC 4/25S, 4/33, 433S, 4/50d, 4/66d	4Meg	500987-002	72 pin	165.00
	8Meg	500987-003		330.00
	16Meg	500987-004		619.00
	32Meg	500987-005		1399.00
Premium 486/25, 25E, 33, 33E				
Premium 386/33TE, 486/25TE, 33TE				
Prem. Serv., Prem II 386SX/2D, 25				
Prem. II 386/25, 386/33, 486/33, 486SX/20	8Meg	500780-001	64 pin	398.00
Premium 386/33T, Prem. 3868X/16				
Prem. II 386SX/20, 25		500780-004		189.00
Premium 386/25, 33, 386/33T, 386SX/16,		500780-003		59.00
Prem. II 386SX20,25		500780-001		59.00
Premia 4/33S, 4/33, 4/50D, 4/66D	8Meg	501159-002		379.00
Premia	16Meg	501159-003		789.00
Premia	32Meg	501159-004		1469.00
Premia	64Meg	501159-005		3111.00
AST Cupid Bd	0–32Meg	500818-001		179.00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	ZST PART #	PRICE
Z386/33, 25, 20, 33E	1Meg	ZA3800ME	59.00
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK	180.00
Z386SX	2Meg	Z-605-1 modules	119.00

MAGNAVOX

286/386SX-16, 386SX-20, 486SX-20 & 386-33 *all are 72PIN SIMM:*
1MEG – 59.00 4MEG – 180.00 8MEG – 349.00 16MEG – 659.00

MEMORY BOARDS

IBM Compatibles & PS/2

BOCA AT PLUS

USES SIMMS

16 BIT MEMORY BD. FOR 286, 386 AT • 0K-8Meg Bd. 4.0 LIM Compat. • New 5 Yr. Warr. Convent., Expnd. & Extnd. Memory • Supports OOS, OS/2, LIM/EMS & EEMS • Versatile Split Memory Addressing • Operates w/CPU Speeds to 33 MHz • Supports Oesqview, Multitask operations • ***Bd. made by Boca Research, AT plus***

0K – $84.00 2Meg – $159.00 4Meg – $239.00 8Meg – $399.00

BOCA XT 8 BIT BUS

• Expanded memory for XT • Lim 4.0 compat. 0-2Meg • Uses 256x1-100

0-K – **$99.00** 1Meg **$189.00** 2Meg – **$229.00**

IBM P/S2 32BIT EXPANSION BD.

0-16Meg, Ext.-Expnd. Memory Bd. for P/S2 70, 80, 90, Lim 4.0

0Meg	2Meg	4Meg	8Meg	16Meg
$139.00	$238.00	$319.00	$499.00	$859.00

PS/2 MCA 0-8MEG EXPANSION BD.

0-8Meg Extended and/or Expanded Memory for all IBM P/S2 Models 50, 50Z, 60, 55SX, 65SX, 16 Bit, 4.0 LIM Compat.

0K – 119.00 2Meg – **199.00** 4Meg – **283.00** 8Meg – **449.00**

USES 1 X 9 SIMMS BOCA BR MC-80

CHANGE YOUR 286 TO A 486

• Features I8M® 486 SLC2 Processor, Clock Doubling, (25/50 or 33/66), 16K of Internal Cache	286 (CPU)	PLCC (Type)	25/50 MHz	279.00
• Simply Replaces existing 286 Processor	286 (CPU)	PGA (Type)	25/50 MHz	279.00

IBM PS/1, PS/2 MEMORY MODULES

IBM PART NO.	WORKS WITH MODEL NO.	PRICE
30F5348 (512K)	30-286	37.00
30F5360 (2Meg)	30-286, 25-286, 50 MTHR 80.	104.00
32G372 (16Meg ecc)	9595 OPT	
6450375 (1Meg)	80-041	79.00
6450379 (2Meg)	80-111, 311-121, 321, 081, 161	84.00
6451060 (4Meg)	80-A21, A-61, 80-A31, 80-111, 80-311	189.00
6450604 (2Meg)	70-061, E61, 121, 50Z, 55SX, 65SX, P-70, 55LS, 65LS, X-Station 120 & 130, 35SX, 35LS, 40SX	89.00
6450608 (2Meg)	70-A21, A-61, 8-21, 8-61, 35SX, 35LS, 40SX, Val Pt. 325T	90.00
78X8955 (128K)	25	35.00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 65LS	175.00
87F9977 (4Meg)	55SX, 55LS, 65SX, 40SX, 35SX, 35LS	175.00
1057035 (512K)	P/S1-286	49.00
92F9935 (2Meg)	P/S1 & P/S1/386SX-2121	109.00
92F9694 (4Meg)	P/S1 & P/S1/386SX, Model-2121	189.00
92G7200 (4Meg)	PSII Expert, Consultant, Willow	184.00
92G7201, 73G3131 (4Meg)	Value Point Performance, PC Server 4/66	184.00
92G7203 (8Meg)	Value Point Performance, PC Server 4/66	359.00
92G7204 (16Meg)	Value Point Performance, PC Server 4/66	699.00
92G7205 (32Meg)	Value Point Performance, PC Server 4/66	1539.00
96F9290 (4Meg)	Standard 1x3-70 Simms	172.00
96F9291 (16Meg)	Standard 4x9-70 Simms	672.00
6450902 (2Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC	90.00
60G1622 (16Meg)	Value Point 77 486DX2, 486SX, SVR 85	699.00
6450128 (4Meg)	P/S1, Value Point Perf.	175.00
	57SX, 90, 95, P-75, 57SLC, 56, 56SLC, P/S1, 386SX, Mod-2123, 2133, 2155, Val Pt 77, 486CS2, 486SX, SVR85	
	Value Point 77 486DX2, 486SX, SVR 85	
6450129 (8Meg)	35SX, 40SX	339.00
6450130 (8Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC	339.00
	Value Point 77 486DX2, 486SX, SVR 85	
6451158 (4Meg ecc)	486; 95XP; 95A (install in pairs)	209.00
6451159 (8Meg ecc)	486; 95XP; 95A (install in pairs	409.00

IBM NOTEBOOK & LAPTOP MEMORY

8189098 (4Meg)	Thinkpad 500, 510CS	199.00
8189099 (8Meg)	Thinkpad 500, 510CS	389.00
8189113 (16Meg)	Thinkpad 510CS	869.00
79F0999 (2Meg)	LX40, N33SX, PS Note, Thinkpad 710T	103.00
79F1000 (4Meg)	LX40, N33SX, PS Note, Tkpd 350, 350c, 710T, PS Note 425	189.00
79F1001 (8Meg)	LX40, N33SX, PS Note, Thinkpad 710T	369.00
07G1415 (4Meg)	Thinkpad 750, 750c, 755 360	209.00
07G1416 (8Meg)	Thinkpad 750, 750c, 755 360	389.00
66G0094 (16Meg)	Thinkpad 750, 750c, 755 360	849.00
07G1420 (4Meg)	CL57LSX LpTp, Thinkpad 700, 700C, 720, 720C	209.00
07G1421 (8Meg)	CL57LSX LpTp, Thinkpad 700, 700C, 720, 720C	389.00
60G0378 (8Meg)	Thinkpad 350, 350c, PS Note 425	339.00
60G0379 (16Meg)	Thinkpad 350, 350c, PS Note 425	649.00
92F8804 (2Meg)	N45SL	109.00

COMPAQ MEMORY MODULES

MODEL	AMT. UPGRADED	CMPQ PART #	PRICE
OeskPro 386/33, 386/33L 486/25, 486/33L, 486/50L, System Pro	2Meg Module	115144-001	139.00
	8Meg Module	116561-001	429.00
	32Meg Module	116568-001	1459.00
OeskPro 386/33L, 486/33L	(Exp 8d)	116569-001	279.00
OeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
OeskPro 386S-16MHz	1Meg Exp 8d	113633-001	149.00
	4Meg Exp 8d	113634-001	279.00
	1Meg Module	113646-001	79.00
	4Meg Module	112534-001	199.00
OeskPro 386/20E	1Meg Exp 8d	113644-001	149.00
OeskPro 386/25E	4Meg Exp 8d	113645-001	279.00
	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	219.00
OeskPro 286N, 386N, 386SX/20, 386/25M, 486/33M, 486S/25M, 486S/16M	1Meg Module	118688-001	59.00
	2Meg Module	118689-001	89.00
	4Meg Module	118690-001	169.00
Port. I Series 486C	8Meg Module	128877-001	389.00
M Series Exp 8d	0-64Meg	129160-001	189.00
OeskPro 386/16	1Meg Kit	108071-001	99.00
	4Meg Kit	108072-001	299.00
	1-2Meg Exp 8d	108069-001	239.00
	4-8Meg Exp 8d	108070-001	437.00
OeskPro 286	512K Kit	113012-001	49.00
OeskPro 5/60, 5/66M, 5/66M — ALL OF THESE MACHINES USE THESE MODULES	8Meg Kit	149911-001	389.00
Prosignia 5/60	16Meg Kit	149949-001	707.00
Proliant 100 5/60	32Meg Kit	149912-001	1399.00
Proliant 2000 4/30, 5/66	64Meg Kit	149913-001	2700.00
Proliant 4000 4/50, 5/66	128Meg Kit	149914-001	5900.00
Prolinea 386 3/25S, 3/252S	2Meg	141738-001	109.00
	8Meg	141742-001	338.00
Prolinea 486 4/25S, 4/33, 4/50, 4/66, COS	2Meg	141683-001	95.00
Enhanced Prolinea, Prosario series	4Meg	141684-001	175.00
	8Meg	141685-001	339.00
Prosignia PC Server, 486/33, 486 OSX/66	8Meg	141685-001	339.00
	16Meg	149320-001	699.00
	32Meg	149147-001	1525.00

COMPAQ LAPTOPS & NOTEBOOKS

LTE/286	2Meg Bd	117081-002	99.00
LTE/286	4Meg Bd	117081-003	179.00
LTE/386S/20	4Meg Module	121125-002	209.00
LTE LITE/20, 25, 25C	4Meg Module	129769-002	209.00
LTE LITE/20, 25, 25C	8Meg Module	129769-003	409.00
LTE LITE/20, 25, 25C	16Meg Module	129769-004	809.00
LTE LITE 425C/33C/25E/255L	4Meg Module	142337-002	189.00
LTE LITE 425C/33C/25E/255L	8Meg Module	142337-003	349.00
LTE LITE 425C/33C/25E/255L	16Meg Module	142337-004	718.00
SLT/286	1Meg Module	110235-001	75.00
SLT/286	4Meg Module	110237-001	219.00
SLT/386	1Meg Module	118303-001	79.00
SLT/386	2Meg Module	118304-001	109.00
SLT/386	4Meg Module	118305-001	219.00
Concerto, LTE Elite	4Meg	144790-001	189.00
	8Meg	144790-002	369.00
	16Meg	144790-003	719.00
Contura 320, 325	2Meg	139497-001	99.00
	4Meg	139498-001	189.00
	8Meg	139499-001	349.00
Contura 4/25, 4/25C, 4/25CX	4Meg	146520-001	189.00
	8Meg	146521-001	339.00
	16Meg	146531-001	739.00
Aero 4/25, 4/33L	4Meg	190532-001	184.00
	8Meg	190597-001	374.00
	16Meg		799.00

NO SURCHARGE FOR MASTERCARD, AMEX, VISA OR DISCOVER. PURCHASE ORDERS ACCEPTED FROM FORTUNE 2000, GOVERNMENT & INSTITUTIONS. California orders add 8.25%sales tax. Returned orders or ordered wrong parts are subject to a 20% restocking fee. (Memory chips not installed in boards.) We accept International orders shipped via UPS Air, APO, FPO orders welcome. Customers are expected to pay customs and "other" charges if shipped Int'l. All credit card charges verified for fraudulent use. SORRY, NO REFUNDS AFTER 30 DAYS – EXCHANGES ONLY. If you receive defective merchandise we exchange only—no refunds. We accept MC, VISA, Discover, AE, prepaid orders, purchase orders, wire transfer, COD (cashiers check) orders, cash & cashiers checks. Orders shipped by UPS, FEDX must be signed for.

• ALL MANFACTURER PART #'S ARE FOR REFERENCE ONLY • MINIMUM ORDER $40.00

CUSTOMER SERVICE & TECHNICAL: OPEN M–F, 9–4 PST

All products Brand new & guaranteed • We buy excess inventory

Trademarks are registered with their respective companies.

L.A. TRADE

22825 Lockness Avenue • Torrance, CA 90501

TOSHIBA LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
T1000SE/XE/LE	2Meg	PC14-PA8312U	79.00
T2000/T2000SX	2Meg	PC18-PA8317U	79.00
T2000SX/T1000LE	4Meg	PC-PA8314U	189.00
T2000SX/T1000LE	8Meg	PC14-PA8315U	359.00
T2000SXE/2200SX/T1800, 1850, C	2Meg	PC-PA2000U	79.00
T2000SXE/2200SX/T1800, 1850, C	4Meg	PC-PA2001U	189.00
T2000SXE/2200SX/T1800, 1850, C	8Meg	PC-PA2002U	359.00
T4400SX, SXC T6400, T6600	4Meg	PC-PA2004U	199.00
T4400SX, SXC T6400, T6600	8Meg	PC-PA2005U	369.00
T4400SX, SXC T6400, T6600	16Meg	PC-PA2010U	699.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	4Meg	PC-PA2012U	199.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	8Meg	PC-PA2013U	389.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	16Meg	PC-PA2014U	769.00
T3300SL	6Meg	PC-PA2008U	268.00
T3300SL	16Meg	PC-PA2009U	699.00
T3400CT, T2400, T3600	4Meg	PC-PA2019V	194.00
T3400CT, T2400, T3600	8Meg	PC-PA2020V	369.00
T3400CT, T2400, T3600	16Meg	PC-PA2021V	763.00
T3400CT	32Meg		1549.00
T1200XE	2Meg	PC13-PA8306	99.00
T1600	2Meg	PC8-PA8302U	99.00
T3100	2Meg	PC3-PA7135E	139.00
T3100e	2Meg	PC9-PA834OU	109.00
T3100SX	2Meg	PC15-PA8308U	109.00
T3100SX	4Meg	PC15-PA8310U	189.00
T3200	3Meg	PC6-PA7137U	185.00
T3200SX	2Meg	PC12-PA8307U	119.00
T3200SX	4Meg	PC12-PA8909	199.00
T3200SXC	2Meg	PC19-PA8318U	119.00
T3200SXC	4Meg	PC19-PA8319U	199.00
T5100	2Meg	PC7-PA8301U	95.00
T5200/T8500	2Meg	PC10-PA8304U	114.00
T5200/T8500	8Meg	PC10-PA8313U	419.00

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
ACER 730	2Meg/4Meg/8Meg		109/209/399
ACER 750	4Meg/8Meg/16Meg		199/459/869
ALR Venture	4Meg	12407980	249.00
AST Ascentia 900N	4Meg/8Meg/16Meg		229/469/899
AST Bravo & Explorer	4Meg/16Meg	501255-001, -002	189/789
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	500814-003	189.00
AST Power Exec 3/25C, 425EL	4Meg		199.00
AST Power Exec 3/25C, 425EL	16Meg		819.00
AST Power Exec 425SL	4Meg	501166-001	199.00
AST Power Exec 425SL	16Meg	501166-003	819.00
AST Power Exec 4/33SL	4Meg/16Meg	501318-001,002	194/769
AT&T Safari NSX/20	4Meg	PEC 37651	259.00
Bondwell 8310, Plus	1Meg	23050-09100	109.00
Bondwell 8310V, SX	1Meg		109.00
Bondwell 8310V, SX	4Meg		229.00
Canon Innova 486	2Meg/4Meg/8Meg		109/209/449
Canon Notejet 486	4Meg/ 8 Meg		199/389
Chicony, Ultra, Hyundai 386	4Meg		199.00
Epson N83	4Meg	A808511	199.00
Everex Tempo LX, LX20, Carrier	2Meg	PCA 00053-0001	109.00
Gateway 2000 Colorbook 4/33	4Meg/16Meg		199/799
Gateway 2000 Nomad 425 DXL/SXL	4Meg/16Meg		199/1199
Gateway 2000 486 Handbook	4Meg/16Meg		199/799
Goldstar GS520 386SX/16	4Meg	S386-4M	249.00
Grid 1720, 1750, 1755	1Meg		49.00
HP Omnibook	2Meg/4Meg		129/279
Magnavox Metalis	1Meg/4Meg	286, 386SX	109/199
NCR Safari 3180	4Meg/ 8 Meg		229/449
NEC Prospeed 286, 386SX-16	1Meg	PC21-21	79.00
NEC Prospeed 286, 386SX-16	4Meg	PC21-22	199.00
NEC Prospeed 386	2Meg	PC31-21	119.00
NEC Prospeed 386	8Meg	PC31-22	399.00
NEC Prospeed 386SX-20	1Meg	PC43-21	79.00
NEC Prospeed 386SX-20	4Meg	PC43-22	199.00
NEC Ultralite Versa	4 Meg/8Meg/16Meg/20Meg	OP4104	183/359/799/988
Packard Bell 386SX, 286	1Meg, 4Meg	286, 386SX	109/199
Packard Bell Statesman	2Meg/8Meg		119/419
Panasonic CF170, CF270, CF370	1Meg	CF-8A165	49.00
Panasonic CF380, CF480	2Meg/4Meg/6Meg		119/199/309
Panasonic CF-V21P, CF-580	4Meg/16Meg		219/819
Sanyo 1718 N8	2Meg	M8C-N8MEM2	109.00
Sharp 6781, 6881, 6785	2Meg/4Meg		109/199
Sharp PC-6220	1Meg	CE 6218	79.00
Tandon, PC Brand, Oataworld	2Meg/8Meg	N8386SX-20	119/429
TI Travelmate 2000	1Meg	2568034-0001	79.00
TI Travelmate 3000	2Meg	2566996-1	84.00
TI 4000, TI 4000E	4Meg/16Meg		199/999
Tandy 1510, 2810, 3810	1Meg		49.00
Tandy 2820, 3820, 3830	2Meg/4Meg/6 Meg		119/199/309
Twinhead, Altima, Compudyne, 486SX, DX, Tandy 4860	4Meg/16Meg		199/859
Ultra 486	2Meg, 4Meg, 6Meg		119/199/309
Zeos 386SX Notebook (not the + version)	2Meg		109.00
Zenith Master Sport 386SX	2Meg	ZA-300-1	114.00
Zenith Master Sport SL, SLE, 600, 620, 625NL	2Meg	ZA-4-4	119.00
Zenith Super Sport 286, 286E	1Meg	ZA-180-66	99.00
286E, SX	2Meg	ZA-180-64	149.00
SX Alpha	2Meg	ZA-180-86	149.00
SX Beta	2Meg	ZA-180-87	149.00
Zenith Z-Note 325L, LC	2Meg/8Meg	ZA3250-4/5	129/419
Zenith Z-Note 425LN, LNC, LNP	4/8/16Meg		269/519/839

PCMCIA VERSION 2.0 (for Palmtop & Subnotebooks)

MODEL	PRICE	MODEL	PRICE
S-RAM Cards 1MEG	159.00	Lan Ethernet (10 8ase T)	159.00
S-RAM Cards 2MEG	179.00	Lan Ethernet (Coax)	159.00
14,400/14,400 Data/Fax Modems	189.00	Visual Media (CD Rom, Tape Dr)	279.00
Readwriter Card	199.00	8us Toaster™ (High speed SCSI II)	299.00
		.Wavjammer™ (16 bit stereo sound card)	319
		105 Mg Type III Hard Drive	457.00

FLASH MEMORY 2.5Meg–299.00 5 Meg–357.00 10Meg–555.00 20Meg–909.00

(Flash Memory Cards appear to the host computer as a hard disk drive. In a DOS environment, your system will see the flash card much like an IDE hard disk drive and assign it a logical drive (e.g.D:) No battery to deal with. Also all capacities come with data compression software to double the amount of flash memory.

LASER PRINTER MEMORY UPGRADES

AMOUNT UPGRADED	OK Bd	256k	1	2	3	3.5	4	5	6	8	16	32
Canon LBP 430	–	–	69	–	–	–	189	–	–	–	–	–
Canon LBP 860	–	–	–	99	–	–	179	–	–	349	669	1249
Canon LBP4, 4Lite, 4plus	–	–	159	219	–	–	–	–	–	–	–	–
Epson 6000, Action Laser	–	–	–	139	–	–	229	–	–	–	–	–
Epson Action Laser II	–	–	89	–	208	–	–	327	–	–	–	–
Epson 8000	–	–	89	–	208	–	–	327	–	–	–	–
Epson 1000, 1500	–	–	–	***119****	–	–	***238****	–	***Call***	–	–	–
HP 2, 2D–	–	–	–	109	–	–	189	–	–	–	–	–
HP 3, 30, 3P, 2P 2P+	–	–	–	99	–	–	169	–	–	–	–	–
HP 4, 4M, 4Si, 4SIMX, 4P, 4MP	–	–	–	89	–	–	169	–	–	349	–	–
HP 4L	–	–	59	–	–	–	–	–	–	–	–	–
HP 3Si	–	–	69	–	–	–	169	–	–	349	–	–
HP 4Si	–	–	–	89	–	–	175	–	–	349	–	–
HP Design Jet 600, 650	–	–	–	–	–	–	175	–	–	349	–	–
HP Deskjet 500, 500C, 510, 550,560	–	55	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C, 1200C/P	–	–	–	89	–	–	175	–	–	349	–	–
HP Paintjet XL300	109	–	–	–	–	–	289	–	–	469	837	–
IBM Laser 4019, 4019E	–	–	–	–	–	169	–	–	–	–	–	–
IBM Laser 4029, 4037	–	–	–	–	–	–	169	–	–	–	–	–
IBM Laser 4039, 4079	–	–	–	99	–	–	169	–	–	350	–	–
NEC 90, 290	–	–	–	139	–	–	–	–	–	–	–	–
NEC 95, 97	–	–	–	99	–	–	–	–	–	–	–	–
Oki 400	–	–	–	89	–	–	–	–	–	–	–	–
Oki 400E, 400EX, 410E, 410EX	–	–	135	189	–	–	–	–	–	–	–	–
Oki 830, 840	–	–	–	109	–	–	–	–	–	–	–	–
Packard Bell P8 9500	–	–	–	139	–	–	227	–	–	–	–	–
Packard Bell 9815	–	–	–	180	–	–	299	–	–	–	–	–
Panasonic 4420/4450I	–	–	–	129	–	–	209	–	–	–	–	–
Panasonic 4410/4430	–	–	–	126	–	–	195	–	–	–	–	–
Panasonic 4450	–	–	99	–	–	–	–	–	–	–	–	–
Panasonic 4400/5400	–	–	Call	Call	–	–	Call	–	–	–	–	–
Panasonic 4440, 5410	–	–	109I	179I	–	–	Call	–	–	–	–	–
Sharp 9400, 9460, 9600, 9700E	–	–	89	149	–	–	249	–	–	–	–	–
TI XL/PS17/PS35	–	–	55	–	–	–	–	–	–	–	–	–
TI Microwriter	–	–	79	159	–	–	–	–	–	–	–	–

*IN STOCK

H.P. COMPATIBLE FONT CARTRIDGE

BAR CODES Bar Code Reader Fonts	99.00
DESKJET SOLUTION for OkJt 500 & Plus. 92 Fonts, 4.5 pt-30 pt	99.00
IBM 4019, 4019E, FONT CARTRIDGE 209 Fonts, Turbo Card	105.00
TURBO 25 Comparable to Pacific Data's 25 CARTRIDGES IN ONE!™, 143 Fonts *(compat. with Epson Action Laser II and all HP Printers except HP4)*	69.00
TURBOSCRIPT™ 109, 109 Scalable Fonts to Any Point Size HP2D, 3, 3D, 3P, 2P, 2P+	149.00
TURBOSCRIPT™ 109, 109 Scalable Fonts to Any Point Size HP2	179.00
TAX & FINANCE FOR IBM 4019, 4019E, 4029	139.00
TAX & FINANCE CARTRIDGE	84.00
DKI 400, 800 41 fonts, 11 typestyles	169.00

310-539-0019
FAX: 310-539-5844

Prices & Availability Subject to Change Without Notice

CALL TOLL FREE

1-800-433-3726
(US and Canada)

ESTAB. 1985

SORRY, NO WILL CALLS

Mon-Fri, 8:00 a.m. to 5:00 p.m. PST
Sat. 10:00 a.m. to 12:00 noon

PRICES MAY FLUCTUATE. CALL FOR LATEST PRICING!!

Get 5 Books for only $4.95

plus 1 book FREE upon prepayment

when you join *The Computer Book Club®*

YES! Rush me the following titles, billing me just $4.95 (plus shipping/handling & sales tax). Enroll me as a member of **The Computer Book Club** according to the terms outlined in this ad. If not satisfied, I may return the books within 10 days for a full refund and my membership will be cancelled. I agree to purchase just 3 more selections at regular Club prices during the next 2 years and may resign anytime thereafter.

Code #'s of my books for $4.95

If you select a book that counts as 2 choices, write the book number in one box and XX in the next.

☐ Bill me (FREE book not available with this payment option.)

SPECIAL OFFER! Prepay your order by check, money order, or credit card and receive a 6th book of your choice FREE.

☐ **YES!** I want the FREE BOOK indicated below. My introductory payment of $4.95 plus $4.95 shipping/handling* and applicable sales tax is enclosed. **Code # of my FREE book:** SINGLE SELECTION ONLY

☐ Check or money order enclosed made payable to: McGraw-Hill, Inc.

☐ Charge my: ☐ VISA ☐ MasterCard ☐ Amer. Exp. ☐ Discover

Acct. No. _____ Exp. Date _____

Signature _____
(required on all credit card orders)

Name _____

Address/Apt.# _____

City _____ State_____

Zip _____ Phone _____

Offer valid for new members only, subject to acceptance by CBC. U.S. orders are shipped 4th Class Book Post. Canada must remit in U.S. funds drawn on U.S. banks. *Canadian orders are shipped International Book Post—add $9.25 shipping/handling. Applicants outside the U.S. and Canada will receive special ordering instructions. A shipping/handling charge & sales tax will be added to all orders. ©1994 CBC

PCW994

Get 5 Books for only $4.95

plus 1 book FREE upon prepayment

when you join *The Computer Book Club®*

YES! Rush me the following titles, billing me just $4.95 (plus shipping/handling & sales tax). Enroll me as a member of **The Computer Book Club** according to the terms outlined in this ad. If not satisfied, I may return the books within 10 days for a full refund and my membership will be cancelled. I agree to purchase just 3 more selections at regular Club prices during the next 2 years and may resign anytime thereafter.

Code #'s of my books for $4.95

If you select a book that counts as 2 choices, write the book number in one box and XX in the next.

☐ Bill me (FREE book not available with this payment option.)

SPECIAL OFFER! Prepay your order by check, money order, or credit card and receive a 6th book of your choice FREE.

☐ **YES!** I want the FREE BOOK indicated below. My introductory payment of $4.95 plus $4.95 shipping/handling* and applicable sales tax is enclosed. **Code # of my FREE book:** SINGLE SELECTION ONLY

☐ Check or money order enclosed made payable to: McGraw-Hill, Inc.

☐ Charge my: ☐ VISA ☐ MasterCard ☐ Amer. Exp. ☐ Discover

Acct. No. _____ Exp. Date _____

Signature _____
(required on all credit card orders)

Name _____

Address/Apt.# _____

City _____ State_____

Zip _____ Phone _____

Offer valid for new members only, subject to acceptance by CBC. U.S. orders are shipped 4th Class Book Post. Canada must remit in U.S. funds drawn on U.S. banks. *Canadian orders are shipped International Book Post—add $9.25 shipping/handling. Applicants outside the U.S. and Canada will receive special ordering instructions. A shipping/handling charge & sales tax will be added to all orders. ©1994 CBC

PCW994

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 9 BLUE RIDGE SUMMIT, PA

POSTAGE WILL BE PAID BY ADDRESSEE

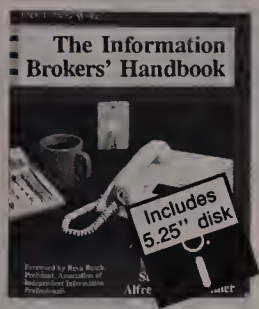
The Computer Book Club®
A Division of McGraw-Hill, Inc.
Blue Ridge Summit, PA 17214-9973

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

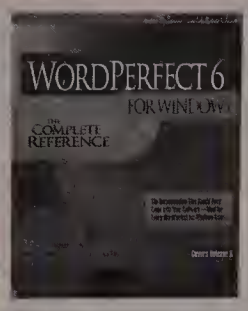
BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 9 BLUE RIDGE SUMMIT, PA

POSTAGE WILL BE PAID BY ADDRESSEE

The Computer Book Club®
A Division of McGraw-Hill, Inc.
Blue Ridge Summit, PA 17214-9973

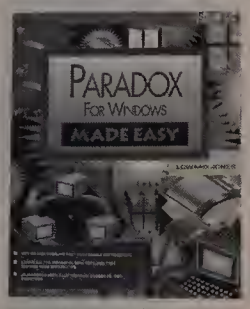


4104H-XX $39.95
Counts as 2/Hardcover

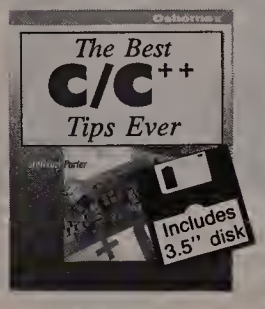


8819261P-XX $29.95
Counts as 2

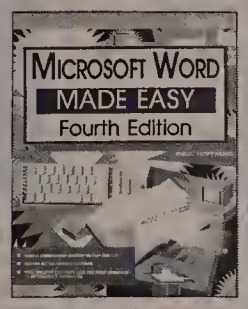
3049P-XX $29.95
Counts as 2



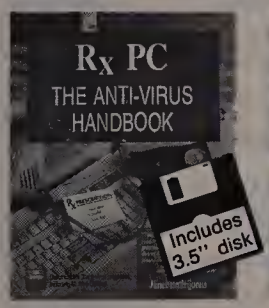
881767P $19.95



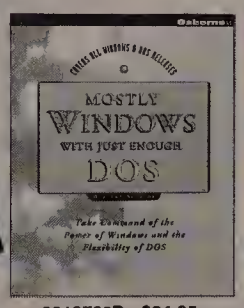
8818206P $29.95



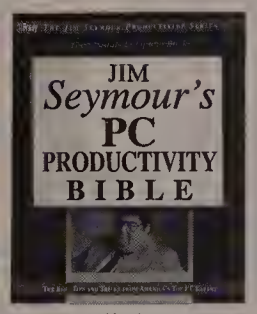
881939P $19.95



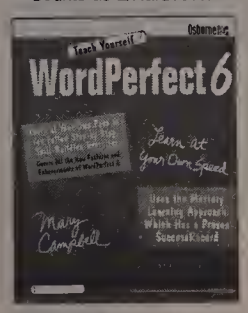
4262H-XX $39.95
Counts as 2/Hardcover



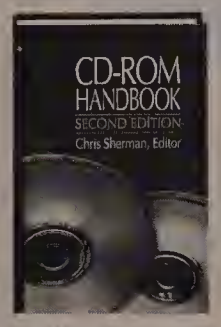
8819768P $24.95



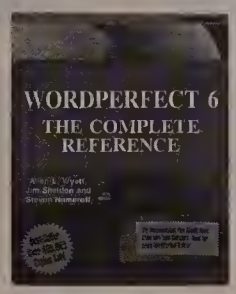
9409H $34.95
Hardcover



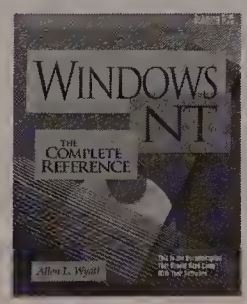
881894XP $24.95



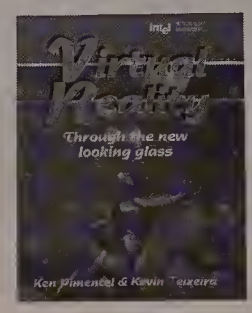
056693H-XX $70.50
Counts as 2/Hardcover



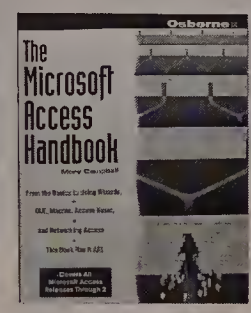
881901P-XX $29.95
Counts as 2



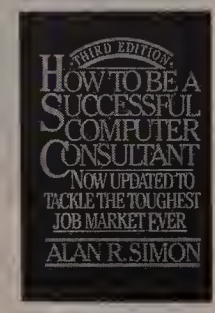
881832XP-XX $29.95
Counts as 2



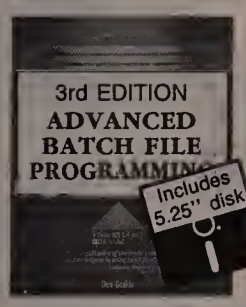
4196P $22.95



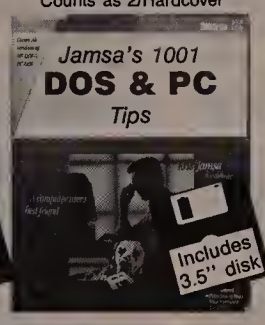
8820146P $27.95



0576173H $30.00
Hardcover

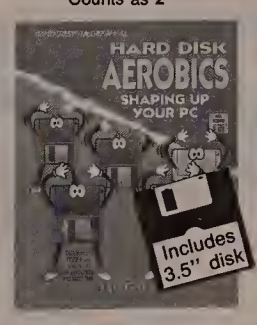


3986P $29.95

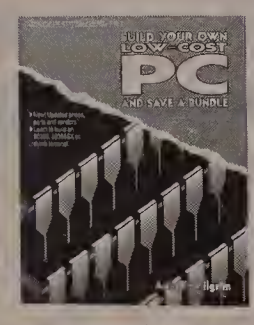


881821P-XX $39.95
Counts as 2

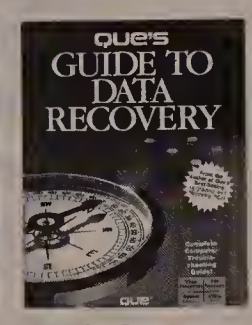
9309P $29.95



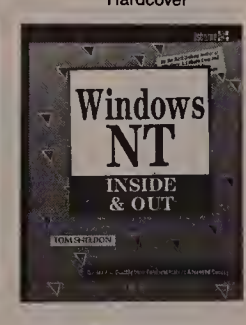
4380H-XX $39.95
Counts as 2/Hardcover



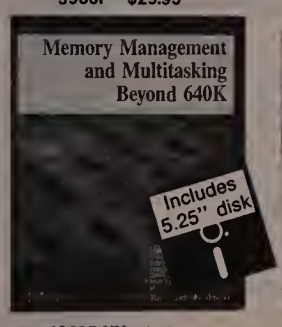
4209P $19.95



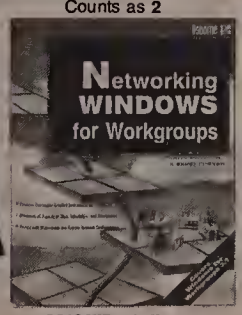
586104P $29.95
Softcover



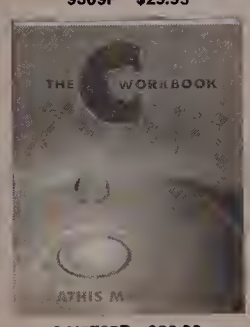
8818265P $27.95



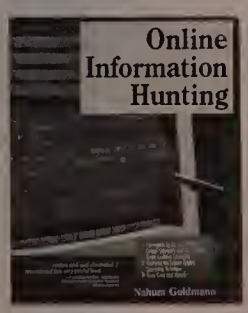
4069P-XX $29.95
Counts as 2



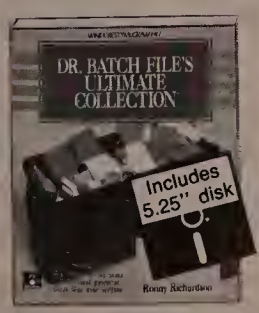
881937P $27.95



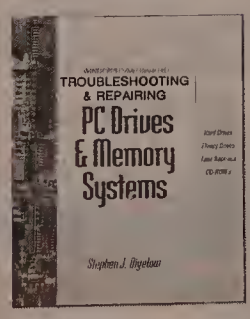
0415765P $28.00



3943P $19.95



4220H-XX $39.95
Counts as 2/Hardcover

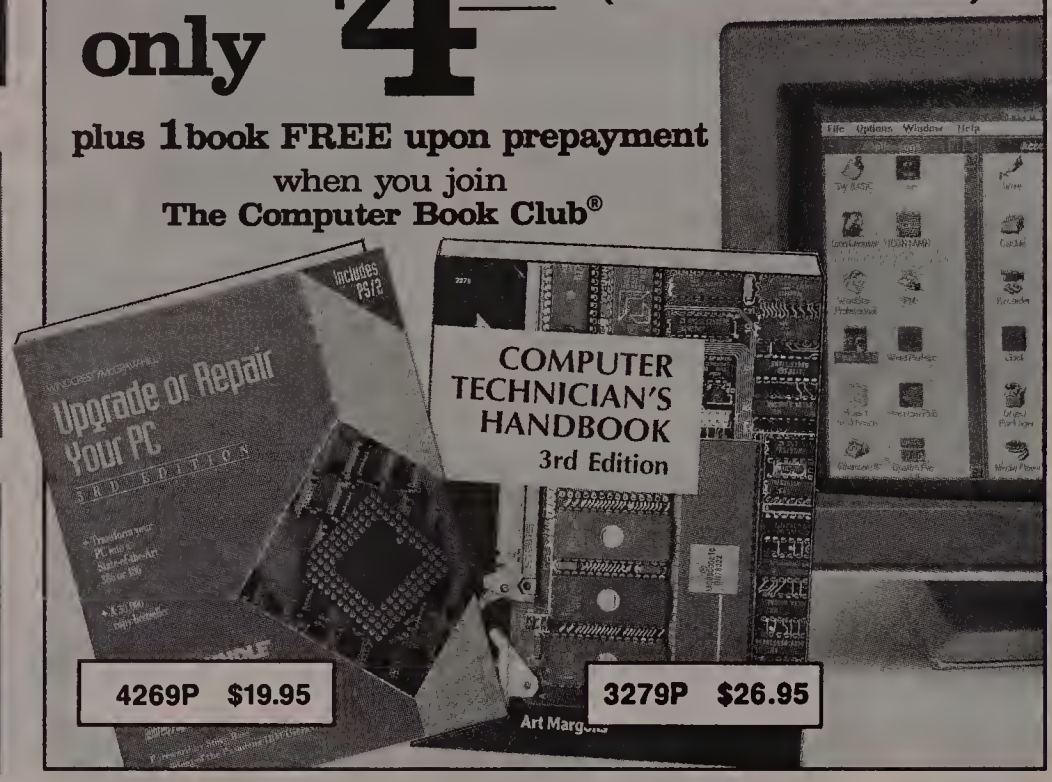


4491H-XX $39.95
Counts as 2/Hardcover

If card is missing, write to:
The Computer Book Club, Blue Ridge Summit, PA 17294-0820

Select any 5 books for only $4.95 (Values to $184.75)

plus 1 book FREE upon prepayment
when you join
The Computer Book Club®



As a member of The Computer Book Club . . .

. . .you'll enjoy receiving Club bulletins every 3-4 weeks containing exciting offers on the latest books in the field at savings of up to 50% off of regular publishers' prices. If you want the Main Selection do nothing and it will be shipped automatically. If you want another book, or no book at all, simply return the reply form to us by the date specified. You'll have at least 10 days to decide. If you ever receive a book you don't want, due to late mail delivery of the Bulletin, you can return it at our expense. And you'll be eligible for *FREE* BOOKS through our Bonus Book Program. Your only obligation is to purchase 3 more books during the next 2 years, after which you may cancel your membership at any time.

PCW994

All books are softcover unless otherwise noted. Publishers' prices shown. If you select a book that counts as 2 choices, write the book number in one box and XX in the next. A shipping/handling charge & sales tax will be added to all orders. ©1994 CBC

USA Flex... Name Brands for Less!

★★★★½ PC/Computing Direct Top 60, July 1994

HEWLETT® PACKARD
Authorized Dealer

FLEX SPECIAL
HP DeskJet 550C Printer

HP's high-quality twin-cartridge black and color printer

$429
C2121A

Order Today! Quantities Limited

- 300 dpi Laser Quality
- Dual inkjet cartridge system for Simultaneous true black and color printing
- Up to 16.7 million colors
- Feeds up to 100 sheets (letter or legal)
- 3-Year Warranty-the longest in the industry

Ink cartridge Color *51625A* /Black *51626A*. .....$29/$25

COMPAQ
LTE Lite/25E
At Our Lowest Prices Ever!

The Compaq LTE Lite 25E features Intel 386SL-25MHz processor, 64K Cache, 4MB RAM (Max. 20MB), 8.5"x 11"x 2", 6.3 lbs., 9.5" high contrast active matrix mono LCD, MS-DOS, Windows & Integrated TrackBall

Limited Quantity

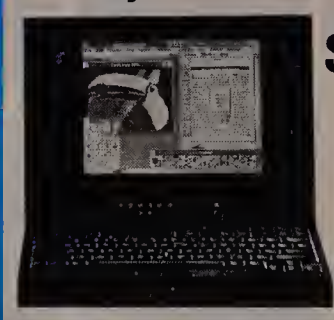
LTE Lite/25E 84MB Hard Drive
138000-003.....$949

LTE Lite/25E 120MB Hard Drive
138000-004.....$999

IBM *ThinkPad® 500*
Major Price Reduction!

Starting At...

$799



Ask Your Sales Consultant For Specific Model Features

Authorized Advanced Products Dealer

ThinkPad 350C 125MB	$1799
ThinkPad 350C 250MB	$2199
ThinkPad 500 85MB	$799
ThinkPad 500 170MB	$999
ThinkPad 360 170MB/340MB	$1999/$2499
ThinkPad 360CS 170MB/340MB	$2599/$3099
ThinkPad 360C 170MB/340MB	$3499/$3999

NEW 3 Year Warranty with FLEX express parts replacement

FLEX PT60
Pentium™ Multimedia System

All For Only **$2995**

Now Includes COREL *CD POWER PAK* Including
- Caching Software *Speeds up your CD-ROM drive*
- System Browser *For CD-ROM troubleshooting*
- Photo CD Lab *Use photo image screen savers & transform photo CD images*
- CorelMOSAIC *Organize & view graphic and photo files*
- CD-Audio Software *Record to your hard drive and edit sound clips*

★FLEX PT60 60MHz System
- Genuine Intel Pentium 60MHz 64bit Processor.
- 256K Ultra-fast "Writeback" Cache Memory
- 8MB RAM, Maximum 128MB on System Board
- 3.5" (1.44MB) Floppy Drive
- 420MB IDE Hard Drive w/ 28K Cache
- 15" .28 NI SVGA 1024x768 *FLEXVISION* MultiScan Monitor

★Hewlett-Packard DeskJet 500C Printer

★SONY/Sound Blaster CD-ROM Bundle
- Sony Double-Spin Internal CD-ROM Drive,
- Creative Labs Sound Blaster 16 Audio Board,
- 8 CD-ROM Discs

★Microsoft Software and Accessories
- Microsoft DOS 6.2, Windows for Workgroups 3.11, Works for Windows • FREE Accessories Kit

HEWLETT® PACKARD
Authorized Dealer

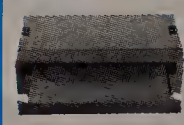
★24/96 Data/Fax Multimedia Modem

Create Your Own Multimedia

1 Choose Your CD-ROM Drive...

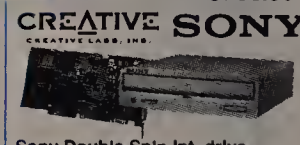
Free CD included with either kit

FLEX CD-PRO STARTER $149 *CDPRO1*



Double Spin Internal CD-ROM drive with interface card and instructions • 320ms access time • 300KB/sec transfer rate • multi-session Kodak PhotoCD Compatible.

FLEX CD-PRO CLASSIC $249 *CDPRO3*



Sony Double Spin Int. drive
- 320ms access time
- 300KB/sec transfer • 64KB buffer

Sound Blaster 16 Sound Card
- 16-bit stereo sampling & playback
- 20-volce • ASP and WaveBlaster upgradable. *Speakers required.*

2 Choose Your CD-ROMs...

1 Free CD is included with either Kit sold above PLUS Buy any 3 more CD-ROMs for only $49! (Ask your sales rep for selection of CD-ROM titles.)

3 Choose Your Speakers...

Select from models by Sony, Jensen, Labtech, Altec Lansing, Panasonic & more!

Ask your Flex consultant for details about this Multimedia offer

PRINTERS

HEWLETT-PACKARD

HP DeskJet 520 - New 600 DPI	$285
HP DeskJet 500C - Color	$345
HP DeskJet 550C - Color	$429
HP DeskJet 560C - New Color	$559
HP DeskJet 1200C - Color	$1429
HP DeskJet 310 - Portable	$299
HP LaserJet 4L - New at Flex	$649
HP LaserJet 4P - New at Flex	$949

EPSON

LASER PRINTERS

ACTION LASER 1100/1500	$489/$649
ACTION LASER 1600	$944

DOT MATRIX PRINTERS

AP 2250	$124	LQ-1170	$598
LX300	$164	LQ-2550 Clr.	$899
AP 3250	$162	DFX-5000+	$1319
AP 3260	$177	DFX-8000	$2249
LQ-570+	$239	Stylus 300	$199
FX-870	$268	Stylus 400	$244
FX-1170	$349	Stylus 800+	$274
LQ-1070+	$364	Stylus 1000	$439
LQ-870	$439	Stylus Color	$558

PANASONIC

LASER PRINTERS

KX-P4410	$469	KX-P5400	$799
KX-P4400	$499	KX-P4440	$989
KX-P4430	$659		

DOT MATRIX PRINTERS

KX-P1150	$129	KX-P1624	$369
KX-P2023	$179	KX-P3123	$249
KX-P2123	$239	KX-P3124	$319
KX-P2124	$309	KX-P3624	$399

CANON

BUBBLE JET PRINTERS*

BJ-10SX / 200e / 230	$215/$254/$359
BJC-600	$535
LBP-430 / 860	$549/$1339

*Prices include $30 Rebate.

PRINTERS (cont.)

TEXAS INSTRUMENTS

microMarc™/ Color	$239 / $379
microWriter	$509
microWriter PS23/PS65	$679/$799
microLaser Pro 600 PS23/PS65	$1359/$1529
Pro 600 imaging cartridge	$159

OKIDATA

OL400E	$498
OL410E	$648
Microline 320/321	$299/$429
Microline 590/591	$424/$584

MONITORS

NEC

14" SVGA	$283	17" 5FGe	$998
15" 3V	$469	17" 5FGp	$1094
15" 3FGe	$557	21" 6FGp	$1998
15" 4FGe	$617		

CTX

14" .39mm	$199
14" .28mm int./ E Star & MPR-II	$239/$249
14" .28mm NI/ E Star & MPR-II	$289/$295
15" .28mm Int./.28 NI	$319/$339
17" .28 NI	$649

MAG Innovision

14" LX1450LG	$269
15" DX15F/MX15F-L	$369/$479
17" DX17F/MX17F-L	$669/$899
21" MX21FG	$1799

SONY

17" CPD-1730E/GDM-17E1	$969/$999
20" GDM2036S	$1899
Universal MAC cable adaptor	$17.95

VIDEO CARDS

ATI Technologies

GRAPHICS ULTRA+ 2MB	$209
GRAPHICS ULTRA™ PRO 2MB ISA/VLB/EISA	$279/$279/$309

VIDEO CARDS

DIAMOND

SPEEDSTAR PRO 1MB ISA/VLB	$109/$109
SPEEDSTAR 64 ISA 1MB/2MB	$155/$199
STEALTH 32 VLB 1MB/2MB	$165/$209
STEALTH 64 VLB 2MB/4MB	$329/$469
VIPER 2MB VLB/PCI	$339/$359

HERCULES

Dynamite Pro ISA 1MB/2MB	$159/$199
Dynamite Pro VLB 1MB/2MB	$159/$189
Dynamite Power 2MB VLB/PCI	$209/$209
Graphite Power ISA 1MB/2MB	$229/$349
Graphite Power VLB 1MB/2MB	$199/$289

ORCHID

Fahrenheit 1280+ ISA 1MB	$139
Fahrenheit 1280+ VLB 1MB/2MB	$159/$199
KELVIN 64 1MB ISA/VLB/PCI	$175
KELVIN 64 2MB ISA/VLB/PCI	$225

MODEMS

HAYES

	Int./Ext.
PCMCIA Optima 144 + Fax	$289
ACCURA 24	$59/$69
ACCURA 144+fax144	$115/$139
Optima 144+ fax144	$369/$379
Optima 144+ fax Pocket Ed.	$299

US ROBOTICS

	Int./Ext.
PCMCIA World Port 14,400 FAX	$199
Sportster 14.4 FAX	$125/$145
World Port 14,400 FAX/Data Pocket	$199
Courier V.Fast 28.8k data/14.4 fax	CALL

BOCA

	Int./Ext.
2400 data, 96/48 S/R Fax	$39/ $59
2400 data, 96/96 S/R Fax	$75/ $95
14.4K with Fax	$89/ $115
Pocket 24/96 Data/Fax	$69
Pocket 14.4K with Fax	$169

NOTEBOOKS

SHARP

PC866OT-3495 Dual-scan color, 200MB $2399
PC8650-II-2799 Active-matrix color, 200MB .. $2999

NOTEBOOKS

EPSON

ActionNote 4SLC2-50 120MB W/Modem	$1429
ActionNote 4SLC2-50 180MB	$1429
ActionNote 4SLC2-50 180MB W/Modem	$1529
ActionNote 500C 180MB W/Modem	$1999
ActionNote 700 120MB/210MB	$1859/$1929
ActionNote 700C 210MB	$2549
ActionNote 700Cx 210MB	$3199

TOSHIBA

T1910/1910CS 200MB	$1459/$1999
T1950CS 200 MB	$2279
T1950CT 200 MB/320MB	$2879/$3149
T1960CT 200 MB	$2999
T3400/T3400CT 120MB	$1689/$2749
T4700CS 200MB/320MB	$3049/$3349
T4700CT 200MB/320MB	$4439/$4769
T4800CT 500MB	$5489
T6600C, C/CD	$6129/$6599

TEXAS INSTRUMENTS

TravelMate 4000E WinSX/25 Mono 120MB	$1729
WinDX2/40 Pass. Color 200MB	$2089
WinDX2/50 Dual Scan Color 200MB	$2359
WinDX2/50 Act. Matrix Color 200MB	$2859
WinDX2/75 8.4"Active Matrix Color 340MB	$3949
WinDX2/75 9.5"Active Matrix Color 455MB	$4459
TM4000 M Mono 120MB HD.	$1849
TM4000 M Active Matrix Color 200MB HD	$2939
TM4000 M Adv. Pass. Color 120MB HD,	$2099
TM4000 M Active Matrix Color 340MB HD	$3359
TM4000 M Active Matrix Color 344MB HD	$4959

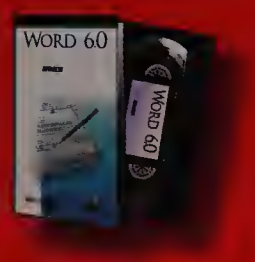
USA FLEX
Code # WD0904

1-800-876-5606
USA Flex, Inc. 471 Brighton Drive, Bloomingdale, IL 60108

No Surcharge On These Credit Cards

FedEx® Available

Circle 148 on reader service card



Video Training for Windows Applications

The KeyStone Advantage

- Saves time—Watch & Learn in Minutes
- Quality trainers teach topics step-by-step
- Train yourself or your staff for one low price
- Learn at your own pace
- Video lasts—always available for review or reuse
- Cost effective—compared to any other training
- A complete training solution
- Average time: 1 hour and 45 min per video
- Broadcast quality production
- Convenient, Efficient & Effective

Customer Comments

"I really enjoyed the training—everything was excellent."

Mary Metzler, Nabisco

"Very, very good, anybody can learn from them"

Hope Thayer, CH&M Hill California, Inc.

"The trainers were professional. The screens were easy to read and the material was comprehensive."

Carl Nelke, Times Herald Record, NY

"I have ordered over 50 tapes for my company on separate occasions—they're great!"

Shirley Burt, Spectrum Emergency Care

Your Personal Video Training Specialists

Dawn Bjork
Corporate Trainer
& MS Word Instructor

Word 6.0

Beg/Int/Adv	(ea) $49.95
Desktop Publishing	$49.95
Mail Merge/Forms	$49.95
Any Three Videos	**$129.95**

WordPerfect 6.0

Beginning	$49.95
Intermediate	$49.95
Advanced	$49.95
Desktop Publishing	$49.95
Any Three Videos	**$129.95**
5.2 to 6.0 Upgrade	$49.95

PowerPoint 4.0

Beginning	**$49.95**
Intermediate	**$49.95**
Advanced	**$49.95**
Any Three Videos	**$129.95**

PageMaker 5.0

Beginning	$49.95
Intermediate	$49.95
Advanced	$49.95
Any Three Videos	$129.95

CorelDRAW 4

Beg/Int/Adv	(ea) $59.95
All Three Videos	$149.95

Dave Bellamy
MS Excel Specialist
& MS Project Instructor

Excel 5.0

Beginning	$49.95
Intermediate	$49.95
Advanced	$49.95
Any Three Videos	$129.95

Project 4.0

Level I/II/III/IV	(ea) $79.95
All Four Videos	$299.95

Lotus 1-2-3 Rel4

Beg/Int/Adv	(ea) $49.95
All Three Videos	$129.95

Ami Pro 3.0

Beg/Int/Adv	(ea) $49.95
All Three Videos	$129.95

Approach 2.1

Beg/Int/Adv	(ea) $49.95
All Three Videos	$129.95

Freelance Graphics

Beg/Int/Adv	(ea) $49.95
All Three Videos	**$129.95**

Organizer 1.1

Beg/Int/Adv	(ea) $49.95
All Three Videos	$129.95

Alison Balter
Corporate/Gov't Trainer
& MS Access 2.0 Instructor

Access 2.0

Beg/Int/Adv	(ea) $49.95
App. Dev. 1/2/3	(ea) $49.95
Any Three Videos	$129.95
Any Four Videos	$159.95

Visual Basic 3.0

Unit 1/2/3	**(ea) $89.95**
All Three Videos	**$249.95**

Paradox 4.5

Beg/Int/Adv	(ea) $49.95
All Three Videos	$129.95

Quattro Pro 5.0

Beg/Int/Adv	**(ea) $49.95**
All Three Videos	**$129.95**

Windows for Workgroups

Windows for WG	$59.95
MS Mail	$49.95
MS Schedule+	$49.95
All Three Videos	$144.95

MS Fox Pro 2.5

Basics	$59.95
Power Tools	$59.95
Both Videos	$99.95

Mark Wright
National Seminar Trainer
& MS Windows Instructor

Windows 3.1

Beginning	$49.95
Advanced	$49.95
Beg/Adv Set	$89.95
DOS & Win Basics	$49.95

Works 3.0

WProcess/Graphics	$49.95
Spreadsheets/DBs	$49.95

Publisher 2.0

Basics	$49.95
Power Features	$49.95

Other Videos

- MS Word 2.0
- MS Word 2.0/6.0 Upgrade
- MS Excel 4.0
- MS Excel 4.0/5.0 Upgrade
- MS PowerPoint 3.0
- MS Project 3.0
- MS Project 3.0/4.0 Upgrade
- MS Access 1.1
- MS Access 1.1/2.0 Upgrade
- Call for Pricing

Special Microsoft Office Video Training

Microsoft Office 4.0 Standard (7 videos/13 hours)..$299.95
Microsoft Office 4.0 Pro (13 videos/24 hours).....$495.95
Microsoft Office 4.0 Plus (15 videos/27 hours).....$579.95

Special Lotus SmartSuite Video Training

Lotus SmartSuite 2 Standard (7 videos/13 hours) ..$299.95
Lotus SmartSuite 2 Pro (13 videos/24 hours) $495.95
Lotus SmartSuite 2 Plus (15 videos/27 hours).....$579.95

Special Borland Office Video Training

Borland Office 2.0 Standard (6 videos/18 hours)...$239.95
Borland Office 2.0 Pro (9 videos/17 hours).....$349.95
Borland Office 2.0 Plus (11 videos/21 hours) $429.95

Special

MS Office Integration Video
$19.95 when purchased with any
MS Office Combination (Reg. $49.95)

KEYSTONE
Learning Systems Corp.

Save $49 to $169 when you take advantage of our Special Video Combinations

KeyStone Learning Systems Training Videos Average 1 hour & 45 minutes of instruction per video

RISK FREE 30 DAY Money Back Guarantee

3 Easy Ways to Order:

CALL 1-800-748-4838
801-375-8680

FAX 1-801-373-6872

MAIL KeyStone Learning Systems Corp.
2181 Larsen Parkway
Provo, UT 84606

Domestic Shipping: $5.00 for the first two video tapes; plus $1.50 for each additional video tape. International Orders: Shipping cost will vary, call for details.

MICROSOFT TRAINING CHANNEL Alliance

VISA MasterCard AMERICAN EXPRESS

We also accept C.O.D., Company P.O. or check

WordPerfect®, MS and Microsoft®, Lotus®, Borland®, Aldus® and their products, are trademarks and/or registered trademark of WordPerfect Corp., Microsoft Corp., Lotus Development Corp., Borland International Inc., and Aldus Corp., respectively

Circle 90 on reader service card

Arlington Computer Products . . . Great Prices and Service Since 1984!

- PC Magazine: *"—Arlington offers worry-free mail order purchasing!"*
- PC Computing: *"Courteous service and terrific technical support!"*
- PC Computing Review: *"5 Star Pricing!"*

10 Year Anniversary!

HEWLETT-PACKARD

Laserjet IV/IV+	$1299/$1439
Laserjet IVP w/Toner	$959
Laserjet IV L w/Toner	$669
Laserjet IV SI w/Toner	$2989
Laserjet IVM+/MP	$1949/$1379
2MG/4MG	$99/$159
8MG Upgrade	$319
Deskjet 550C	$429
Deskjet 520/560	$289/$569
Deskjet 1200C	$1439
Deskjet 1200C P/S	$2099
IIC Scanner	$949

OKIDATA

ML320	$295	ML395	$949
ML321	$415	3410	$1199
ML380	$205	OL400E	$495
ML520	$365	OL410E	$645
ML521	$489	OL810	$899
ML590	$409	OL830	$1089
ML591	$559	OL850	$1189

Okilaser 2MG $129
DocIt 3000 ..... $1799
DocIt 4000 ..... $2129

Canon

BJ-10SX	$209*
BJ-100	$249*
BJ-200E	$255*
BJ-230	$359*
BJC-600	$529*
LBP-430	$549*
LBP-860	$1069*

*After Rebate
**Dual Color - $1799

CANON 486-SL/25 Mhz - $1199**

• 120 MG • Fax Modem

EPSON PRINTERS

FX870 $259	LQ870 $425	LQ2550 $879	Stylus 800 $269	Action 3250 $169
FX1170 $345	LQ1070+ $355	DFX5000 $1299	Stylus 1000 $429	Action 1500 $639
LQ570+ $235	LQ1170 $589	DFX8000 $2189	Stylus Color $549	Action 1600 $929

Thousands of Printers in Stock!!! — Most shipped same day!!!

Panasonic Office Automation

2023	$179	4400	$449
2130	$199	4410	$449
2124	$295	4430	$639
2624	$389	4440	$989
3123	$269	5400	$779

4410/4450I 2 MG ... $125

NOTEBOOKS

Canon 486-120 MG	$1199
Canon 486-120 MG-Color	$1889
Canon Notejet 200	$1929
Notejet 200 MG-Color	$2499
Notejet II-50/260 MG	$2949
TM486/DX 2/50E Color	$2829
TM4000E DX 4-75	$3549

NETWORKING

Netware 3.12 5 User	$569
Netware 3.12 10 User	$1289
Netware 3.12 25 User	$1849
Netware 3.12 50 User	$2349
Netware 3.12 100 User	$3349
Netware 4.0 10 User	$1599
Lantastic Starter 5.0	$409
2000C Noderunner	$159
NE2000/5-Pack	$69/$329
SMC Hub T/P 12	$509
Ethercard +/+16	$89/$115
3 Com EtherLink III	$109
3 Com EtherLink 5-Pack	$469
Intel Ether 16	$89
Intel Ether 16-5 Pack	$429
Intel Ether 16-20 Pack	$1579
Intel Flash/5-Pack	$99/$475
Intel Token 16/4	$339
Intel Netport EL	$355
Xircom Pocket Ethernet	$249

SCAN. & DIGIT.

Epson Action Scanning	$749
Epson Scanning Prof.	$1189
Scanman 256 Omni Page	$185
Summasketch 12×12	$255
Summasketch 12×18	$499

SHARP

JX9400	$449
JX9460PS	$895
PC8650	$2599
PC8650 II	$2749

MONITORS

NEC

2V/3V	$329/$459
3 FGE/4 FGE	$539/$589
5 FGP	$1079
5 FGE	$969
6 FGP	$1949

MAG

DX/MX 15F 15"	$345/$459
DX/MX 17F 17"	$659/$779

NANAO

F340IW/F560IW	$649/$1229
F550I/F550IW	$899/$979
T560I/F760IW	$1459/$1979

VIEWSONIC

15/17G	$429/$769
17	$879
20/21	$1499/$1679

VIDEO BOARDS

ATI Graph Ultra + 2MG	$189
ATI Graph Prof 2 MG	$259
ATI Graph Terbo	$359
Diamond Viper 2 MG	$329

CHIPS

1MB/4 MB Simms	$49/$149
Cyrix DRx2-20/40	$229
Cyrix DRx2 25/50	$265
Cyrix DRx2 33/66	$319
Epson Action 2 MG	$139
Intel 80387 SX/DX	$75/$85

intel — OVERDRIVE

Sx2-50 Dble 20-25 Mhz	$189
Dx2-50 Dble 20-25 Mhz	$259
Dx2-66 Dble 33 Mhz	$289

MODEMS

intel

Int. 14.4/14.4 Fax	$115
Ext. 14.4/14.4 Fax	$135
PCMCIA 24/96	$129
PCMCIA 14.4/14.4	$195

SatisFAXtion MODEMS

200/300	$199/$219
400 14.4/14.4 Fax	$259
400 Ext 14.4/9600 Fax	$289

Hayes

Accura 14.4/Int/Ext.	$119/139
Accura 28.8 Ext.	$255
Optima 96/14.4	$309/$339
Optima 28.8 Ext.	$399
Pocket 14.4	$289
PCMCIA 14.4	$289

PRACTICAL PERIPHERALS

14.4 Fax Int/Ext	$105/$119
14.4 Pocket	$269
28.8 Int/Ext	$219/$229
PCMCIA 14.4	$265

US Robotics

Terbo Dual Std. Fax	$679
14.4 Int/Ext.	$109/$125
Sportster 14.4 Int. Fax	$119
Sportster 14.4 Ext. Fax	$135
Courier Terbo Int. Fax	$335
World PortPCMCIA 14.4	$195

GVC

14.4 w/Fax Int/Ext	$85/$95
28.8 Int/Ext	$185/$195

SOFTWARE

Aldus Pagemaker 5.0	$499
Corel Draw 4.0	$359
D Base IV	$379
Harvard Graphics	$299
Lotus 123 2.4/3.1	$279/$325
Microsoft Windows 3.1	$79
Microsoft Office	$449
Microsoft Off Pro	$519
Microsoft DOS 6.2	$69
Q & A 4.0	$179
Word Perfect 6.0	$249
Word Perfect Windows	$269

DRIVES & TAPES

Dual Floppy	$99
3½" 1.44	$39
Connor 250	$139
Connor Parallel 250	$289

COLORADO

Colorado Jumbo 120	$99
Colorado Jumbo 250	$149
Colorado Trakker 250	$299
Qik 80 Formatted Tape	$19
Power Tape 2400 1.2 Int.	$939

AMERICAN UPS

250	$99	600	$259
400	$155	900	$359
450	$185	1250	$485

CD ROM OPTICAL DISKS

Chinon 535 Int/Ext	$299/$389
Sound Blast 16 SCSI 2	$169
Texel 3028 Int/Ext	$289/$329
Mitsumi Int DS	$149

Triple Speed!!!

NEC 3Xi	$409
NEC 3Xe	$439
NEC 3Xp/4X Pro	$369/$869

SEAGATE HARD DISKS

260 MG 3290A	$225
341 MG 3391A	$239
452 MG 3550A	$329
535 SCSI 3655N	$519
542 MG IDE 3655A	$389

Arlington Computer Products, inc.

Prices and availability subject to change without notice. Purchase orders accepted from Qualified Customers. No surcharge for Charge Cards!

HOURS C.S.T.
7:30 - 8:30 pm Mon.-Frl.
9:00 - 5:00 pm Saturday

1970 CARBOY
MT. PROSPECT, IL 60056

VISA MasterCard DISCOVER

FOR ORDERS & QUOTES: **800-548-5105**

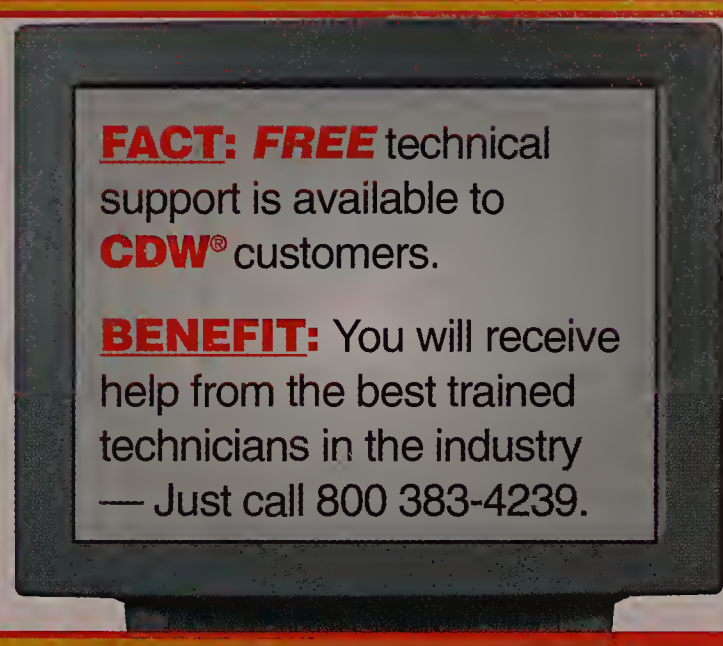
CUSTOMER SERVICE AND IN ILLINOIS 708-228-6333
SHIPPING 708-228-9748
TECHNICAL ASSISTANCE 708-228-1470
We Export! FAX 708-228-0516

Circle 8 on reader service card

COMPUTER DISCOUNT WAREHOUSE™

CDW® CIRCLE OF SERVICE

ANOTHER FACT ABOUT COMPUTER DISCOUNT WAREHOUSE™



WHY PAY RETAIL? CDW® SELLS SOFTWARE FOR LESS!

Adobe Illustrator V4.0 Win 441.82
Adobe Photoshop V2.5.1 Win 565.75
Aldus Freehand V3.1 Win 372.36
Aldus Pagemaker V5.0 Win 554.66
Aldus Pagemaker V5.0 Win upg 129.55
Aldus Type Twister V1.0 Win 28.99
Arabesque ECCO Pro V1.1 Win 247.55
Arabesque ECCO Simplicity V2.0 ..... 63.94
Autodesk AutoCAD LT V1.0 Win 411.08
Autodesk Autosketch V2.0 Win 182.09
Avantos Manage Pro V2.0 Win 207.70

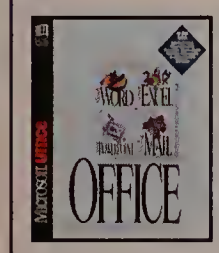
Lotus Approach V3.0 for Windows™
ONLY
$98.56
43508

Banner Blue ORG+ Adv V2.0 Win 115.85
Berkeley After Dark Win 29.01
Berkeley After Dark-Star Trek Win 29.14
Berkeley Disney Screen Svr Win 29.20
Berkeley More After Dark Win 27.06
Borland C++ V4.0 ..... 329.33
Borland dBASE IV V2.0 DOS 519.79
Borland dBASE IV V2.0 DOS LIC 279.82
Borland dBASE IV V2.0 DOS UPG 92.80
Borland dBASE V5.0 DOS 524.12
Borland dBASE V5.0 DOS vers upg 143.92
Borland dBASE V5.0 Win 327.09
Borland dBASE V5.0 Win upg 191.53
Borland Paradox V4.5 DOS 524.30
Borland Paradox V4.5 DOS upg 134.82
Borland Paradox V4.5 Win 134.46
Borland Quattro Pro V5.0 DOS 49.95
Borland Quattro Pro V5.0 Win 39.95
Borland ReportSmith V2.0 Win 93.39
Borland Sidekick V1.0 Win 31.44
Borland Turbo C++ V3.0 ..... 66.04
Borland Turbo C++ Win visual ed 73.76
Borland Turbo Pascal V1.5 Win 98.77
Borland Turbo Pascal V7.0 DOS 99.10
Broderbund Automap Win 47.13
Broderbund Printshop Dlx V1.2 Win 48.22
Carmen Sandiego/World Dlx CD 55.28
CNN Time Capsule 1993 Win CD 27.18
Caere OmniPage Pro V5.0 Win 439.15
Caere PageKeeper V1.1 Win 358.46
Caere Personal PegeKeeper V1.2 Win 97.17
Calera WordScan Plus V3.0 Win 381.24
Coloredo Backup V1.1 Win 37.51
CA Clipper V5.2 ..... 477.48
CA Clipper V5.2 comp upg 122.75
CA Clipper V5.2 vers upg 104.42
CA Realizer V2.0 Win 71.70

MICROSOFT MS-DOS® V6.22 Upgrade
ONLY
$49.74
42994

CA SuperCalc V5.5 ..... 97.28
Corel CD Power Pack w/headphones 37.39
Corel Gallery V1.0 Win CD 34.93

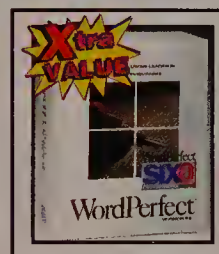
CorelDRAW V3.0 ..... 128.33
CorelDRAW V3.0 CD only 98.56
CorelDRAW V3.0 to V5.0 upg CD only 305.18
CorelDRAW V4.0 ..... 363.47
CorelDRAW V4.0 CDonly 249.22
CorelDRAW V4.0 to V5.0 upg 214.38
CorelDRAW V4.0 to V5.0 upg CD only 174.07
CorelDRAW V5.0 ..... 567.42
CorelDRAW V5.0 CD only 433.82
CorelSCSI V2.0 ..... 82.21
CompuServe Member Kit Win 26.49
Claris FileMaker Pro V2.1 Win 116.83
Claris Works V1.0 Win 91.34
Dariana WinSleuth Gold+ 59.38
DCA Crosstalk V2.1 Win 95.62
Delrina Communications Suite V2.0 Win 106.55
Delrina WinFAX Pro Network 238.10
Delrina WinFAX PRO V4.0 ..... 79.34
DeLorme MapExpert Win 248.12
Farallon Timbuktu V1.0 Win 127.76
Fractal Design Dabbler V1.0 Win 59.38
Fractal Design Painter V2.0 Win 243.65
Frame Tech Framemaker V4.0 Win 562.98
Generic CADD V6.1 DOS 238.10
HP Dashboard V2.0 Win 46.28
Hayes Smartcom V1.0 Win 44.75
Helix Netroom V3.0 DOS 58.80
IBM OS/2 for Windows V2.1 ..... 51.15
IBM OS/2 for Windows V2.1 CD 39.18
IBM OS/2 V2.1 ..... 142.49
IBM OS/2 V2.1 UPG 112.14
IBM PC-DOS V6.3 UPG 49.68
Inset Systems Hijaak Pro V2.0 Win 78.21
Intuit Quickbooks V2.0 Win 94.89
Intuit Quickbooks/Quickpay V2.0 DOS 125.37
Intuit Quicken Companion V2.0 ..... 26.69
Intuit Quicken V3.0 Win 43.22
Intuit Quicken V7.0 DOS 44.14
Intuit QuickPay V3.0 DOS/Win 47.36
LaserTools Print Cache 47.00



MICROSOFT Office Professional V4.3 for Windows™ Upgrade
ONLY
$351.00
39330

Landmark WinProbe V2.01A 41.41
Lotus 1-2-3 V2.4 DOS 321.54
Lotus 1-2-3 V2.4 DOS node 298.73
Lotus 1-2-3 V2.4 DOS upg 94.77
Lotus 1-2-3 V3.4A DOS server 395.42
Lotus 1-2-3 V3.4A DOS upg 95.11
Lotus 1-2-3 V4.01 + Organizer Win 344.37
Lotus 1-2-3 V4.01 + Organizer Win upg 107.78
Lotus 1-2-3 V4.01 Win 293.07
Lotus 1-2-3 V4.01 Win license 233.98
Lotus 1-2-3 V4.01 Win upg 93.97
Lotus Ami Pro V3.01 Win 249.22
Lotus Ami Pro V3.01 Win superbundle 226.70
Lotus Ami Pro V3.01 Win upg 95.04
Lotus Approach V3.0 Win 98.56
Lotus cc:Mail Desktop V2.03 Win 66.09
Lotus cc:Mail Desktop V4.02 DOS 66.22
Lotus cc:Mail Mobile V2.0 Win 127.70
Lotus cc:Mail Router V5.1 ..... 198.24
Lotus Freelance V2.01 Win 321.54
Lotus Freelance V2.01 Win upg 93.97
Lotus Improv V2.1 Win 96.48
Lotus Notes Client V3.0 Win 403.25
Lotus Notes Starter Pack V3.0 Win 805.15
Lotus Organizer V1.1 Win 91.34
Lotus ScreenCam V1.0 Win 52.73
Lotus SmartSuite V2.1 Win 446.39
Lotus SmartSuite V2.1 Win upg 289.17
LucasArts Rebel Assault 45.91

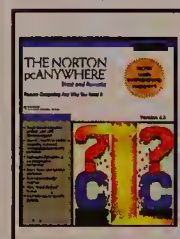
Mathsoft MathCAD V5.0 Win 89.74
McAfee VirusScan V1.5 Win 76.49
Microcom Carbon Copy V2.5 Win 102.76
Microcom Carbon Copy V6.1 DOS 124.87
MECA Managing Your Money V10.0 ..... 35.56
Procomm Plus V1.02 Win 93.17
Procomm Plus V2.01 DOS 67.60
Micrografx ABC Flowcharter V2.0 Win 179.86
Micrografx Draw V1.0 Win 47.98
Microhelp Uninstaller V2.0 Win 39.20
Microsoft Access V2.0 Win 294.42
Microsoft Access V2.0 Win dev kit 299.00
Microsoft Access V2.0 Win upg 114.01
Microsoft Arcade V1.0 Win 27.63
Microsoft Bookshelf 1994 CD 59.94
Microsoft Cinemania 1994 CD 52.00
Microsoft Complete Baseball 1994 Win CD 53.59



WordPerfect V6.0a for Windows The Perfect Upgrade
ONLY
$69.94
41608

Microsoft Creative Writer V1.0 Win 43.48
Microsoft Dinosaurs CD 51.96
Microsoft Electronic Forms Design V1.0 Win 234.93
Microsoft Encarta 1994 CD 83.34
Microsoft Excel V5.0 Win 294.42
Microsoft Excel V5.0 Win comp upg 113.82
Microsoft Excel V5.0 Win vers upg 89.52
Microsoft Fine Artist V1.0 Win 42.28
Microsoft Flight Simulator V5.0 DOS 42.28
Microsoft FORTRAN V5.1 ..... 148.22
Microsoft FoxPro V2.6 DOS 89.52
Microsoft FoxPro V2.6 DOS dist kit upg 23.20
Microsoft FoxPro V2.6 DOS upg 24.84
Microsoft FoxPro V2.6 Pro DOS 412.97
Microsoft FoxPro V2.6 Pro DOS upg 259.95
Microsoft FoxPro V2.6 Pro Win 411.59
Microsoft FoxPro V2.6 Pro Win upg 259.89
Microsoft FoxPro V2.6 Win 89.52
Microsoft FoxPro V2.6 Win dist kit upg 23.66
Microsoft FoxPro V2.6 Win upg 23.37
Microsoft Golf V1.0 Win 43.12
Microsoft Money V3.0 Win 27.61
Microsoft MS-DOS V6.22 step-up 9.95
Microsoft MS-DOS V6.22 upg 49.74
Microsoft MS-DOS V6.22 upg 3pk 112.12
Microsoft Multimedia Beethoven CD 52.59
Microsoft Multimedia Golf CD 42.26
Microsoft Musical Instruments CD 52.05
Microsoft Office Pro V4.3 Win 533.67
Microsoft Office Pro V4.3 Win CD 445.22
Microsoft Office Pro V4.3 Win upg 351.00
Microsoft Office V4.2 Win 445.22
Microsoft Office V4.2 Win license 379.29
Microsoft Office V4.2 Win upg 263.48
Microsoft PowerPoint V4.0 Win 294.28
Microsoft PowerPoint V4.0 Win upg 115.72
Microsoft Profit V1.0 Win 118.73
Microsoft Project V4.0 Win 412.97
Microsoft Project V4.0 Win vers upg 131.67
Microsoft Publisher V2.0 Win 85.51
Microsoft Publisher V2.0 Win design pk 34.54
Microsoft Schedule+ V1.0 Win starter kit 116.33
Microsoft Testing Tools for Windows V2.0 ..... 296.78
Microsoft TrueType Font Pack 45.53
Microsoft Visual Basic Pro V3.0 Win 294.42
Microsoft Visual Basic Pro V3.0 Win comp upg 175.28
Microsoft Visual Basic V3.0 Win 118.62
Microsoft Visual Basic V3.0 Win comp upg 89.52
Microsoft Visual Basic V3.0 Win vers upg 48.11
Microsoft Visual C++ Pro V1.5 CD 355.90
Microsoft Visual C++ V1.0 Win 72.62
Microsoft Visual C++ Windows NT 355.93
Microsoft Windows NT V3.1 ..... 294.39
Microsoft Windows NT V3.1 adv server 883.73

Microsoft Windows NT V3.1 upg 259.93
Microsoft Windows V3.11 ..... 89.50
Microsoft Windows V3.11 license 78.14
Microsoft Windows V3.11 upg 49.97
Microsoft Windows/Wrkgroups V3.11 ..... 131.21
Microsoft Windows/Wrkgroups V3.11 add-on 45.54
Microsoft Word V6.0 DOS 294.42
Microsoft Word V6.0 DOS vers upg 113.82
Microsoft Word V6.0 Win 295.96
Microsoft Word V6.0 Win upg 114.01
Microsoft Word V6.0 Win vers upg 97.30
Microsoft Works V3.0 DOS 91.62
Microsoft Works V3.0 Win 85.63
Moon Valley Icon Hear-It 11.97
Maxis SimCity 2000 DOS 41.04
Maxis Wrath of the Gods 43.47
Norton Lambert Close-Up V6.0 ..... 115.37
Petton&Patton Flowcharting 4 Win 162.91
Peachtree Accounting V2.0 Win 104.21
Peachtree Complete Accounting V7.0 DOS 173.74
Persoft Smarterm 420 V3.0 Win 161.83
Qualitas 386MAX V7.0 DOS 58.23
Querterdeck DESQVIEW 386 V2.6 ..... 91.10
Querterdeck Desqview V2.0 Win 164.04
Quarterdeck OEMM V7.0.3 ..... 59.38
Quarterdeck OEMM V7.0.3 UPG 39.58
Quarterdeck OEMM V7.0.3 w/game bundle 65.99
Quarterdeck SideBar V1.0 Win 35.93
Quark QuarkXPress V3.3 Win 603.47
SPC Harvard Graphics V2.0 Win 197.39
SPC Harvard Graphics V2.0 Win upg 73.92
SPC Harvard Graphics V3.06 DOS 339.00
Saber LAN Workstation V5.0 ..... 135.58
Saber LAN Workstation V5.0 node 36.58
ShapeWare Visio Express for MS Office 49.56
Shapeware Visio V2.0 Win 115.22
Spinnaker Calendar Creator V2.0 Win 38.96
Stacker V4.0 special upg 49.53
Stacker V4.0 Win/DOS 91.57
Symantec ACT V2.0 Win 172.63
Symantec ACT V2.1 DOS 246.65
Symantec Direct Access V1.0 Win 62.79
Symantec Direct Access V5.1 DOS 63.38
Symantec Norton Anti Virus V3.0 DOS/Win 79.92
Symantec Norton Backup V3.0 Win 94.20
Symantec Norton Desktop V3.0 Win 109.24
Symantec Norton Utilities V8.0 DOS/Win 108.84
Symantec PC Tools V2.0 Win 87.91
Symantec PC Tools V9.0 DOS 88.49
Symantec pcAnywhere V1.0 Win 123.30
Symantec pcAnywhere V5.0 DOS 109.74



Symantec® pc ANYWHERE™ V1.0 for Windows™
ONLY
$123.30
27994

Symantec pcAnywhere V5.0 DOS remote 81.08
Symantec Q&A V4.0 DOS 249.72
Symantec Q&A V4.0 Win 149.64
Symantec Q&A V4.0 Win comp upg 91.34
Symantec XTree Gold V3.0 DOS 93.56
Symantec XTree V2.0 Win 61.38
Timeslips V5.1 DOS 179.30
Timeslips V5.1 Win 179.97
Touchstone Check It Pro: Set 79.38
Traveling SW Laplink V V5.0 DOS 85.21
Virgin 7th Guest CD 48.58
WordPerfect InfoCentral V1.0 Win 88.99
WordPerfect Informs Designer/Filler V1.0 ..... 279.82
WordPerfect V5.1+ DOS 279.83
WordPerfect V6.0a Win 208.80
WordPerfect V6.0a Win license 211.60
WordPerfect V6.0a Win perfect upg 69.94
WordPerfect V6.0b DOS 249.88
WordPerfect V6.0b DOS license 182.89
WordPerfect V6.0b DOS perfect upg 89.34

CDW® HOURS
Sales:7:00-9:00 CDT Mon-Fri. / 9:00-5:00 CDT Sat.
TECH SUPPORT
8:00-7:00 CDT Mon-Fri. / 9:00-5:00 CDT Sat.
(800)383-4239

Credit Card charges are not submitted until time of shipment. Freight is calculated as the carrier's actual freight charge plus insurance and packaging material. The cost of insurance is 0.35% (0.0035) of the order total. Packaging materials will not exceed $4.00 per 1 package order or $6.00 per multi-package shipment. For your protection we ship only to your verified billing address. Non-defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. All pricing subject to change. ™ - Trademarks of all companies listed in this ad.

CDW® CIRCLE OF SERVICE
PCW1015

WE SELL NAME BRAND ITEMS FOR LESS!

(800) 865-4CDW

FAX
(708) 465-6800

NASDAQ
CDW® is a NASDAQ traded company
TICKER SYM8OL CDWC
D & B Rated 4A1 Duns 10-762-7952

Turn the Page For More CDW® Savings.

No Surcharge For Credit Cards

VISA DISCOVER MasterCard CDW

High Volume Bids invited

©1994 CDW® Computer Centers, Inc.

Circle 68 on reader service card

COMPUTER DISCOUNT WAREHOUSE™

COMPUTER DISCOUNT WAREHOUSE™

COMPUTER DISCOUNT WAREHOUSE™

IBM ThinkPad® 500
50MHz subnotebook

SUMMER SIZZLER

SAVE UP TO $700

- ✔ 486SLC2 50/25 Mhz CPU
- ✔ 4MB RAM Std., 12MB Max.
- ✔ 85MB or 170MB hard drive
- ✔ 1) Type II PCMCIA slot
- ✔ Keyboard-integrated TrackPoint II pointing device
- ✔ One year international warranty, 24 hr./7 day toll-free assistance

ThinkPad 500 w/85MB HD ONLY! **$799.00** CDW 39402

ThinkPad 500 w/85MB HD ONLY! **$999.00** CDW 33722

Supplies are limited...call you CDW account executive today!

WHY PAY RETAIL?

CDW® Sells For Less

NEW

AST Authorized Systems Reseller

AST Advantage!
100MHz desktop computer

- ◆ IntelDX4™ 100MHz CPU ◆ 8MB RAM standard
- ◆ 540MB IDE hard drive ◆ 1MB video RAM
- ◆ Internal 9600 bps voice/data/fax modem
- ◆ Software bundle: MS-DOS, Windows, Lotus 1-2-3, Ami Pro and Organizer, Phoenix Fax, Prodigy and America On-Line and more

Special Purchase!.....**$1879.85** CDW 43675

HARDWARE, SOFTWARE & PERIPHERALS AT *DISCOUNT* PRICES

NETWORKING PRODUCTS

NOVELL

Netware V4.01

5 USER CD	776.57
10 USER CD	1765.90
25 USER CD	2588.41
50 USER CD	3461.67

Netware V3.12

5 USER 3.5"	577.73
10 USER 3.5"	1297.55
25 USER 3.5"	1898.00
50 USER 3.5"	2578.00
100 USER 3.5"	3698.00

Call for Pricing on NetWare CD-ROM Versions and Upgrades

PERSONAL NETWARE V1.0 NEW

1 USER	59.88
5 USER	259.52

NOVELL PRICING IS SUBJECT TO CHANGE. PLEASE CALL CDW FOR THE MOST CURRENT PRICING.

THOMAS-CONRAD CORPORATION

TC5143 Ethernet coax	116.47
TC5143 Ethernet coax 6pk	667.25
TC5143 Ethernet 10BT	89.95
TC5143 Ethernet 10BT 6pk	469.88
TC6242 ARCNET 8-bit coax	66.86
TC6245 ARCNET coax	179.99
TC6242 ARCNET+ TP	95.94
TC6040 ARCNET passive 4 port hub coax	39.50
TC5055 Ethernet 8 port hub 10BT	339.47
TC4045 Token Ring 16/4	309.33

CDW Carries the Complete Line of TCNS Products. Call for Details!

ARTISOFT

NodeRunner 2000A	215.58
NodeRunner 2000T	169.05
NodeRunner 2000C	169.05
NodeRunner/SI 2000A	93.50
NodeRunner/SI 2000T	76.70
NodeRunner/SI 2000C	76.70
LANtastic V6.0	79.50
LANtastic V6.0 5 user	322.90
LANtastic V6.0 Starter Kit	299.00
Central Station II	389.13
10BT 5 port internal hub	256.72
NodeRunner starter kit-WIN	479.29
Simply LANtastic starter kit	193.67
Simply LANtastic V1.0	54.89
T-Runner 8 port 10BT	293.92
T-Runner 12 port 10BT	488.41

SMC®

Ultra16 ETHERNET COAX	105.25
Ultra16 COAX 6PK	576.75
Ultra16 COAX 24PK	2206.96
Ultra16 ETHERNET 10BT	105.25
Ultra16 10BT 6PK	534.20
Ultra16 10BT 24PK	1857.28
Ultra16 ETHERNET COMBO	119.35
Ultra16 COMBO 6PK	639.21
Ultra16 COMBO 24PK	2252.32
EtherCard+ ELITE COAX	119.64
EtherCard+ ELITE COAX 6PK	628.73
EtherCard+ ELITE MCA COAX	189.26
EtherCard+ ELITE 10BT	119.12
EtherCard+ ELITE 10BT 6PK	618.61
EtherCard+ ELITE MCA 10BT	181.57
EtherCard+ ELITE EISA 10BT	579.78
EtherCard+ ELITE COMBO	139.57
EtherCard+ ELITE COMBO 6PK	753.59
3608 Ethernet 8 PORT CON 10BT	298.85
3512 Ethernet 12+2 port hub 10BT	548.55
PC600WS ARCNET coax	119.93
PC650WS ARCNET TP	119.88
PC600FS ARCNET coax	199.29
PC130 ARCNET coax	68.50
ARCNET 8 port active hub coax	229.41
TokenCard Elite 16/4	249.88

3Com®

3C503 Etherlink II coax	159.44
3C509 Etherlink III coax	115.50
3C509 Etherlink III coax 5 pk	489.02
3C509 Etherlink III 10BT	115.50
3C509 Etherlink III 10BT 5 pk	442.36
3C509 Etherlink III combo	132.73
3C509 Etherlink III combo 5 pk	532.84
3C579 Etherlink EISA coax	229.91
3C579 Etherlink EISA 10BT	229.91
3C1627 12 port Linkbuilder 10BT	638.95

NETWORKING PRODUCTS

OTHER TOP-QUALITY NAME BRANDS

Eagle NE2000+ coax	85.20
Eagle NE2000+ 10BT	77.31
Eagle NE3200 coax w/TPA	453.83
National Semi NE2000+ coax	78.24
National Semi NE2000+ 10BT	71.35

If You Don't See What You Are Looking For,.Call. CDW Carries the Best Networking Selection in the Industry!

Xircom

PE310BC pocket Ethernet coax	309.89
PE310B2 pocket Ethernet coax	267.80
PE310BT pocket Ethernet 10BT	268.31
PA202B6 pocket ARCNET coax	229.30
Pocket Token Ring III	455.89
PPX03 Parallel port multiplexor	77.80
14.4K bps pocket modem	459.74

IBM TOKEN RING

IBM Token Ring 16/4 ISA	422.03
IBM Token Ring 16/4 MCA	489.56
IBM Token Ring MAU	458.88

intel

EtherExpress 16 coax	99.33
EtherExpress 16 coax 5pk	454.13
EtherExpress 16 coax 20pk	1698.38
EtherExpress MCA coax	166.52
EtherExpress 16 10BT	99.33
EtherExpress 16 10BT 5pk	454.13
EtherExpress 16 10BT 20pk	1698.38
EtherExpress MCA 10BT	166.52
EtherExpress 16 combo	116.77
EtherExpress 16 combo 5pk	549.72
EtherExpress 16 combo 20pk	2036.93
EtherExpress FLASH 10BT	111.88
EtherExpress FLASH 10BT 5pk	515.62
EtherExpress FLASH combo	129.79
EtherExpress FLASH combo 5pk	599.00
EtherExpress EISA coax	409.88
TokenExpress 16/4	349.94
NetportExpress II COAX	368.85
NetportExpress II 10BT	368.85
EtherExpress ISA hub	519.93
EtherExpress ISA hub exp	449.96

TAPE, REMOVABLE & FLOPPY DRIVES

COLORADO MEMORY SYSTEMS INC.

Jumbo 120MB internal	99.80
Jumbo 250MB internal	174.34
Trakker 120MB parallel port	209.90
Trakker 250MB parallel port	344.40
Powertape 2.4GB SCSI internal	937.58
Powertape 2.4GB SCSI external	1077.99
PowerDAT 4GB SCSI internal	1127.79

iOMEGA

Tape 250MB internal	169.57
Floptical 21MB internal	379.27
Bernoulli90MB PC Powered Pro	298.49
Bernoulli150MB internal SCSI	479.11
Bernoulli 150MB internal IDE	469.59
Bernoulli 150MB PC Powered	494.76
Bernoulli 150MB Transportable	568.26
90MB cartridge	89.27
150MB cartridge	92.80

MICROSOLUTIONS

Backpack 3.5" 1.44MB floppy parallel	153.40
Backpack 5.25" 1.2MB floppy parallel	165.38
Backpack 340MB HD parallel	439.75
Backpack 2X CD-ROM parallel	377.44
Backpack 250MB tape backup parallel	355.05

SyDOS

Pro Note 42MB parallel	418.17
Puma 88MB parallel	442.44
88MB w/16-bit adapter external	539.81
Puma 105MB parallel	514.94
Marlin 105MB IDE internal	478.26

TAPE, REMOVABLE & FLOPPY DRIVES

Mountain.

TD-250 250MB IDE internal	189.32
FS8500 305MB IDE internal	449.50
SideCar II 305MB parallel	358.77
1200-4 4GB SCSI external	2045.39
750MB-1.5GB w/adapter external	1254.69

WYSE TERMINALS

Wyse 30 amber or green	272.89
Wyse 55 amber/green/white	223.21
Wyse 55 amber/green/white	229.83
Wyse 60 amber/green/white	279.60
Wyse 150 amber/green/white	265.45
Wyse 160 amber/green/white	329.88
Wyse 325 color	427.40

MULTIMEDIA, SOUND, CD

Altec Lansing ACS300 speakers/subwoofer	239.69
Creative Labs Discovery 16 internal	328.88
Creative Labs SoundBlaster 16 AWE32	289.22
Creative Labs SoundBlaster Pro value edition	82.45
Creative Labs SoundBlaster 16 SCSI-2	148.09
Creative Labs SoundBlaster 16 ASP MCD	175.67
Diamond Sonic Sound basic	224.58
Diamond Sonic Sound LX	109.30
Media Magic 2X CD-ROM Kit internal	149.88
Media Magic DSP-16 System internal	312.26
Media Magic ISP-16 System internal	284.10
Media Magic ISP-16 Sound Board	76.45
Microsoft Bookshelf 1994 CD	65.79
Microsoft Cinemania 1994	52.88
Microsoft Windows Sound System	52.95
Microsoft Encarta 1994	85.24
Microsoft Multimedia Beethoven	52.88
Microsoft Windows Sound System w/board	138.10
Orchid GameWave 32	108.87
Orchid SoundWave 32	169.15
Sigma Designs ReelMagic Lite	291.30
Diamond Sonic Sound Pro upg kit	93.31
Sony Desktop Library w/sound external	479.54
Sony Desktop Library w/sound internal	467.73
Sony Desktop Library internal	235.05
Turtle Beach Monterey sound card	349.77
Video Logic 928Movie VLB 1MB	301.73

CD-ROM & OPTICAL DRIVES

CHINON CDS535 INT CD-ROM KIT	347.60
CHINON CDX535 EXT CDROM KIT	427.88
Mitsumi FX-001D 2X int kit	148.40
NEC 3XI INTERNAL	439.37
NEC 3XE EXTERNAL	469.52
NEC 3Xp Portable	399.19
NEC 4X PRO	899.00
Orchid Soundwave/CD Multimedia KIT	355.52
Pioneer DRM604X 6 DISC Quadraspin	1109.50
PLEXTOR 3028 240MS INT KIT	309.42
PLEXTOR 5028 240MS EXT KIT	419.27
SONY CDU-33A Int 2X CD-ROM Kit	159.78
SONY CDU535 INT CD-ROM	274.72
SONY CDU55S 220ms internal SCSI	226.36
SYDOS PARALLEL PORT CD-ROM	289.49
Toshiba 3401 EXT SCSI CD-ROM	446.22
Toshiba 3401 EXT SCSI CD-ROM W/ADPT	567.50
Toshiba 3401 INT SCSI CD-ROM	317.60

PLOTTERS, DIGITIZERS & SCANNERS

HURTA®

XGT 12X12 SER & ADB	213.96
XLP 12 X 18 16 BUTTON	438.93

CalComp

DB III 12X12 4 BUTTON	248.90
DB III 12X12 16 BUTTON	248.90
DB III 12X18 W/PRES PEN	399.85
DB III 12X18 16 BUTTON CORDLESS	696.85
SLATE 12X12 W/PRES PEN	363.40
SLATE 12X12 W/16 BUTTON	239.91

PLOTTERS, DIGITIZERS & SCANNERS

Canon

IX4015 COLOR SCANNER*	967.42

** after $30 manufacturer rebate (ends 8/31/94)*

Summagraphics.

SUMMASKETCH III 12 X 12 16 BUTTON	253.90
SUMMASKETCH III 18 X 12 4 BUTTON	524.44

HOUSTON INSTRUMENT

HI 7100 A-D SIZE 8 PEN	2598.78
HI 7200 A-F SIZE 8 PEN	3387.22

HEWLETT PACKARD

HP SCANJET IIP	509.06
HP SCANJET IIP DOCUMENT FEEDER	269.93
HP SCANJET IICX W/ ISA	995.50
HP SCANJET IICX DOCUMENT FEEDER	474.72
IICX TRANSPARENCY ADAPT.	633.26

EPSON

ActionScanner ES600C	796.86
ActionScanner ES800C	1065.00
ActionScanner ES800C PRO	1238.53

VIDEO PRODUCTS

VGA & SUPER VGA MONITORS

Mag Innovision MX15F	479.86
Mag Innovision DX15F	382.31
Mag Innovision MX17F	809.79
Mag Innovision MX17FG	839.14
Mag Innovision DX17F	698.00
Magnavox CM2089 14" .28	249.80
Magnavox CM2099 14" .28 NI	264.00
Magnavox CM4015 15"	359.85
Magnavox CM4017 17"	648.20
Magnavox 20CM64 20" SPECIAL!*	999.00

**while supplies last*

Nanao F340iW 15"	659.00
Nanao F550i 17"	927.11
Nanao F550iW 17"	1029.00
NEC 2V 14" **	314.50
NEC 3V 15" **	427.49
NEC 3FGE 15"	557.17
NEC 4FGE 15"	617.19
NEC 5FGE 17"	998.50
NEC 5FGp 17"	1097.21
NEC 6FGp 21"	1997.00

*** after $25/$40 manufacturer rebate (ends 9/30/94*

Philips Brilliance 17"	959.33
Philips Brilliance 21"	2239.45
Sony 15SF 15"	447.92
Sony CPD1730 17"	947.73
Sony 17SE 17"	969.88

VGA & SUPER VGA DISPLAY CARDS

ADS VGA TO TV ELITE	224.57
ATI Graphics Ultra+ 2MB	229.10
ATI Graphics Ultra Pro 2MB	284.22
ATI Graphics Ultra Pro 2MB EISA	394.92
ATI Graphics Ultra Pro 2MB VLB	284.25
CREATIVE LABS VIDEO SPIGOT	237.73
DIAMOND STEALTH 32 VLB 2MB	232.31
Diamond SpeedStar 64 ISA 1MB	165.85
DIAMOND SPEEDSTAR PRO 1MB	114.86
DIAMOND VIPER VLB 2MB	337.86
HERCULES DYNAMITE PRO VLB	159.33
HERCULES GRAPHITE POWER ISA 1MB	246.37
HERCULES GRAPHITE POWER ISA 2MB	363.12
INTEL SMART VIDEO RECORDER	369.80
Orchid Kelvin 64 ISA 1MB	182.96
Orchid Kelvin 64 ISA 2MB	226.36
Orchid Kelvin 64 VLB 1MB	149.83
Orchid Kelvin 64 VLB 2MB	194.19

If You Find a Better Price, Call CDW® Before You Buy (800) 865-4CDW

NASDAQ

BUY WITH CONFIDENCE
CDW® IS A NASDAQ TRADED COMPANY
TICKER SYMBOL CDWC
D & B Rated 4A1
Duns 10-762-7952

No Surcharge For Credit Cards

VISA DISCOVER MasterCard

Credit Card charges are not submitted until time of shipment. Freight is calculated as the carrier's actual freight charge plus insurance and packaging material.The cost of insurance is 0.35% (0.0035) of the order total.Packaging materials will not exceed $4.00 per 1 package order or $6.00 per multi-package shipment. For your protection we ship only to your verified billing address. Non-defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. All pricing subject to change. ™ - Trademarks of all companies listed in this ad.

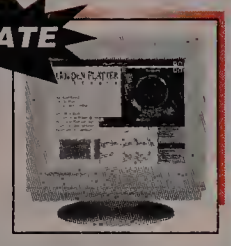
CDW® HOURS
Sales 7:00 -9:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.
Tech Support for Customers
8:00-7:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.

MOST ORDERS SHIP THE SAME DAY

COMPUTER DISCOUNT WAREHOUSE™

CDW CIRCLE OF SERVICE

NEC REBATE



MultiSync 2V 14" and 3V 15"

★ Flat square, non-glare CRT, .28mm dot pitch ★ Max. resolution 1024 x 768 n.i. ★ Refresh rate @ 1024 x 768: 2V, 70Hz; 3V, 60Hz ★ Up-front user controls, tilt/swivel base ★ 3 year warranty

NEC 2V™ ..... **$314.50**[1] CDW 42741
NEC 3V™ ..... **$427.49**[2] CDW 32663

[1] includes $25.00 manufacturer rebate
[2] includes $40.00 manufacturer rebate
(rebate ends 9/30/94)

WHY SETTLE FOR LESS?

CDW® SERVICES YOU BETTER

Megahertz — Linking Your Worlds

CDW's #1 PCMCIA

14,400 bps PCMCIA FAX Modem with XJACK®

- Rugged XJACK® connector pops out for use and back in for travel
- XJACK® connector eliminates bulky cables and podules
- Auto installation ● Hot swappable ● Advanced Error Correction
- 5-year warranty

GOLD SERIES with Flash ROM and MNP 10

NEW LOW PRICE! $229.00 CDW 37757

CDW® CARRIES OVER 15,000 PRODUCTS. IF YOU DON'T SEE IT, CALL!

COMPUTERS

TOSHIBA

910 200MB	1489.16	T1960CT 200MB	2996.96
910CS 200MB	1999.00	T1960CT 320MB	3289.91
950CT 200MB	2947.07	T3400CT 120MB	2689.90
950CT 320MB	3213.90	T3600CT 250MB	4095.14
960CS 200MB	2395.56		

700CS 200MB/320MB act color ... 3123.74/3369.38
700CT 200MB/320MB act color ... 4499.00/4849.00
800CT 500MB act color ... 5495.47
600C 510MB act color ... 6099.00
600C 510MB CD act color ... 6599.00

AST

vantage! 4/100D 540MB 8MB	1879.85
centia 4/50D 340MB pas color	3434.63
centia 4/50D 340MB act color	4949.55
centia 4/75D 340MB pas color	4045.22
centia 4/75D 510MB act color	5908.73

BRAVO SERIES

4/33S 170MB	1126.07	LC 4/66D 340MB CD	2334.60
4/33S 270MB	1352.62	LC 4/100D 270MB	2212.16
4/33D 170MB	1363.78	LC 4/100D 540MB	2499.99
4/33D 270MB	1589.33	MT 4/66D 170MB	1774.71
4/50S 170MB	1267.80	MT 4/66D 340MB	2222.02
4/50S 270MB	1517.79	MT P60 270MB	2476.12
4/66D 270MB	1858.18	MT P60 540MB CD	3301.87
4/66D 540MB	2233.18		

avo NB 4/33S 200MB mono	1643.08
avo NB 4/33S 200MB pas color	2267.73

EPSON

tionNote 4SLC50 120MB+modem	1442.05
tionNote 4SLC50 180MB+modem	1534.75
tionNote 500C 120MB+modem	1822.49
tionNote 500C 180MB+modem	1973.99
tionNote 700 120MB mono	1988.16
tionNote 700C 120MB pas clr	2469.93
tionNote 700C 210MB pas clr	2556.35
tionNote 700CX 210MB act clr	3208.77

IBM ThinkPad Portables

4/50SLC2 85MB	799.00	350 250MB	1899.00
4/50SLC2 170MB	999.00	350C 120MB	1799.00
125MB	1499.00	350C 250MB	2199.00

PS/ValuePoint Systems

SX Si 120MB	875.00	466D 364MB	2575.00
SX Si 212MB	945.00	466D 527MB	2725.00
DX Si 212MB	1289.00	466D 527MB	2835.00
SDX2 Si 212MB	1689.00	4100D 364MB	2839.00
tium 5/60 527MB	3319.00	PCI 4100D 527MB	3099.00

NEC VERSA NOTEBOOKS

rsa S 433SX 210MB mono	1906.66
rsa S 4/33SX 210MB pas color	2333.00
rsa S 4/33SX 210MB act color	3298.88
rsa S 4/50DX2 260MB act color	3789.93
rsa E 4/40 120MB act color*	3339.50
rsa E 4/40 250MB act color*	3759.81
rsa E 4/50 209MB act color*	4031.78
rsa E 4/50 340MB act color*	4447.64
rsa E 4/75 340MB act color*	4799.25
rsa E 4/75 528MB act color	5199.08
ady 433SX 270MB CD	1349.45
ady 466DX 340MB CD	1699.85
ady 466M 430MB 3X CD	1906.66
ady 4100M 420MB 3X CD	2353.17
werMate 433SX 270MB	1119.32
werMate 466DX 420MB	1519.91
werMate 466MT 420MB	1559.89
werMate 4100MT 420MB	1969.50
age 4100 210MB	2279.83
age 4100 420MB	2414.80
age 4100 420MB CD	3199.19

** includes $200 manufacturer rebate (ends 7/31/94)*

PACKARD BELL

rce Multimedia 4/25 210MB	1083.92
rce 4/33SX 210MB	849.00
rce Multimedia 4/33SX 340MB	1338.58
rce Multimedia 4/50SX2 420MB	1549.47
rce Multimedia 4/66DX2 420MB	1979.25
rce Multimedia 5/60 420MB	2405.05
rce 4/50SX2 340MB	1178.39
rce 4/66DX2 420MB	1549.47
rce MT 4/66DX2 420MB	1729.70

TEXAS INSTRUMENTS

4000M 4/25 120MB mono	1899.95
4000M 4/25 120MB adv pas clr	2347.46
4000M 4/25 200MB act color	3197.17
4000M 4/75 344MB act color	4974.40
4000E 4/25 120MB adv pas clr	1749.46
4000E 4/50 200MB dual color	2389.51
4000E 4/50 200MB act color	2919.87
4000E 4/75 340MB act color	3686.80
4000E 4/75 455MB 9.5" act color	4538.64

COMPUTERS

Canon NoteJet notebooks

4/33 120MB mono	1922.37	4/33 200MB pas clr	2577.43
4/33 200MB mono	2014.39	4/50 130MB pas clr	2846.81
4/33 120MB pas clr	2477.93	4/50 260MB pas clr	3014.46

INNOVA NB 4/33S 120MB MONO	1298.57
INNOVA NB 4/33 170MB MONO	1368.49
INNOVA NB 4/33S 170MB PAS COL	1875.71
INNOVA NB 4/33S 260MB MONO	1458.40
INNOVA NB 4/33S 260MB PAS CLR	1959.07
INNOVA 4/50L 170MB	1329.55
INNOVA 4/50L 240MB	1408.96
INNOVA 4/66L 240MB	1614.88

DOT MATRIX & LASER PRINTERS

OKIDATA

184 TURBO	219.14	ML590	429.51
ML320	304.45	ML591	585.87
ML321	432.43	Pacemark 3410	1222.92
ML380	214.95	OL400E	499.98
ML395	989.32	OL410E	649.31
ML395C	1039.74	OL810	905.50
ML520	369.82	OL830+	1079.11
ML521	495.18	OL850 PS	1199.20

Canon

BJ10SX *	214.88	BJC600 COLOR*	548.25
BJ200E*	259.00	LBP430 LASER*	558.50
BJ230*	358.00	600DPI 8PPM*	1268.57

** after $30 manufacturer rebate (ends 8/31/94)*

EPSON

AP2250	122.58	LQ2550	898.08
AP3250	161.51	DFX5000 Plus	1364.86
AP3260	181.43	DFX8000	2269.45
LX300	165.01	Stylus 300	199.54
FX870	267.59	Stylus 400	241.22
FX1170	354.95	Stylus 800	249.97
LQ570+	237.97	Stylus Color	559.70
LO1070+	365.35	ActionLaser 1500	656.70
LO870	444.91	ActionLaser 1600	933.63
LO1170	609.93		

IBM LEXMARK LASER PRINTERS

4037 5E 5PPM	657.17
4029-10 10PPM	1115.42
4039-10R 10PPM	1299.46
4039-10RD 10PPM DUPLEX	1719.84
4039 16L PLUS	2775.03
4039 12L PLUS	1891.25
4039 12R PLUS	1409.76
WinWriter 600	1197.38

NEC

SuperScript 610	477.78
Silentwriter 640	734.60

Panasonic

1150	133.49	3123	249.00
1624	385.20	4410 Laser	547.15
2023	182.27	4430 Laser	686.91
2124	318.41	4440 Laser	1019.76
2130	203.80	4400 Laser*	456.96
2135 Color	246.71	5400 Laser**	712.98
2624	409.49		

*after *$50 or **$100 manufacturer rebate (ends 9/30/94)*

TEXAS INSTRUMENTS

MICROMARC INKJET	243.75
MICROMARC COLOR INKJET	379.13
MICROWRITER BASIC	507.16
MICROWRITER PS23	677.22
MICROWRITER PS65	819.90
MICROLASER PRO 600 PS23	1355.20
MICROLASER PRO 600 PS65	1524.25
POWERSTEP UPG- mL600	274.68

SHARP PRINTERS

SHARP JX9400 300DPI 4PPM	477.09
SHARP JX9460PS 600DPI 6PPM	945.75

HEWLETT PACKARD

DeskJet PORTABLE 310 w/CSF	367.00
HP DeskJet 500C	388.20
HP DeskJet 520	289.00
HP DeskJet 560C	569.00
HP DeskJet 1200C	1449.61
HP DeskJet 1200C PS	2167.20
HP PaintJet XL300	2258.93
LaserJet 4L	679.56
LaserJet 4P	979.74
LaserJet 4MP	1469.89
LaserJet 4plus	1478.25
LaserJet 4M plus	1998.27
LaserJet 4SI	2998.95
LaserJet 4SI MX	4508.36

**while supplies last*

COSTAR

LabelWriter II DOS/Win	178.00
Address Express	329.00

HARD DRIVES & CONTROLLERS

Maxtor

170MB IDE	192.73	345MB SCSI	296.12
345MB IDE	269.52	540MB IDE	377.07

MICROPOLIS

2210A 1050MB IDE	778.19
2210 1050MB SCSI	806.38
4110 1050MB SCSI	759.50
2217 1.7GB SCSI	1036.41
2210AV 1.050GB SCSI AV	869.38
2217AV 1.765GB SCSI AV	1099.22
1936 3GB SCSI	2098.00

CONNER

210MB IDE	199.09	426MB IDE	269.94
343MB IDE	259.51	1GB SCSI	779.45
343MB SCSI	283.28		

Seagate

130MB IDE	187.81	452MB IDE	331.16
200MB IDE	214.74	535MB SCSI-2	655.25
261MB IDE	237.80	1.0GB SCSI-2	734.57
341MB IDE	249.08	1.69GB SCSI-2	1597.21

WESTERN DIGITAL

Caviar 210MB IDE	209.48	Caviar 420MB IDE	271.01
Caviar 250MB IDE	237.71	Caviar 540MB IDE	381.69
Caviar 340MB IDE	243.10		

CONTROLLERS

ACCULOGIC IDE W/1PAR, 2SER, 1GAME	35.06
ACCULOGIC IDE W/BIOS	48.90
ACCULOGIC VLB IDE	89.76
ADAPTEC 1510A SCSI-2 CD KIT	89.86
ADAPTEC 1542CF SCSI-2	265.45
ADAPTEC 2742T EISA SCSI-2	339.22
ADAPTEC 2842 VLB SCSI-2	257.23
Promise IDE ISA Cache	99.88
Promise IDE VLB Cache	115.29

MODEMS & COMMUNICATIONS

U.S. Robotics

SPORTSTER MODEMS

28.8K w/fax internal	209.91	14.4K external	135.50
28.8K w/fax external	227.88	14.4K w/fax external	139.50
14.4K internal	116.59	Worldport 14.4K w/fax	236.09
14.4K w/fax internal	119.50		

COURIER MODEMS

V.34 Ready w/fax internal	397.06
V.34 Ready w/fax external	432.62
V.34 Ready Dual Std. internal	526.92
V.34 Ready Dual Std. external	562.44

Hayes

ACCURA 14.4 + FAX14.4 INT	118.81
ACCURA 14.4 + FAX14.4 EXT	139.73
ACCURA 28.8K V.FC w/fax	259.31
OPTIMA 14.4 EXT	363.80
OPTIMA 14.4 + FAX14.4 EXT	374.30
OPTIMA 14.4 + FAX14.4 Pocket	296.93
OPTIMA 28.8 + FAX14.4 EXT	421.54
ULTRA 14.4 EXT	623.07

PRACTICAL PERIPHERALS

14.4K w/fax internal	107.38
14.4K w/fax Mini Tower	124.80
28.8K w/fax internal	228.20
28.8K w/fax Mini Tower	244.26

intel

SatisFAXtion 200 internal	209.50
SatisFAXtion 400 internal	278.33
SatisFAXtion 400 external	309.59
14.4K w/fax internal	119.00
14.4K w/fax external	139.50

BOCA

14.4K w/fax internal	89.00
14.4K w/fax external	113.61
28.8K w/fax internal	188.98
28.8K w/fax external	216.30

MICROCOM

Deskporte ES 14.4K	179.00
Deskporte Fast ES 28.8K	234.77
Deskporte Fast EP 28.8K	308.00

MOTOROLA

FasTalk II 14.4K w/fax internal	119.78
FasTalk II 14.4K w/fax external	139.84

BATTERY BACKUP AND UPS

AMERICAN POWER

BACK UPS 250	105.86	BACK UPS 1250	518.46
BACK UPS 400	168.25	SMART UPS 400	299.69
BACK UPS 450	189.71	SMART UPS 600	363.38
BACK UPS 600	275.60	SMART UPS 900	514.61
BACK UPS 900	374.15	SMART UPS 1250	644.24

SURGEARREST NETWORK NEW	34.97
SURGEARREST PRO NEW	33.58
SURGEARREST NETWORK + PHONE	48.65
LINE-R 600	119.09

TRIPP LITE

BC250	99.11	BC600 LAN	249.00
BC400	155.59	BC750 LAN	313.90
BC500	189.42	BC900 LAN	359.67
BC500 LAN	199.40	BC1250 LAN	459.10

Smart UPS SERIES NEW

SMART 250 LAN	232.46	SMART 900 LAN	463.83
SMART 400 LAN	279.22	SMART 1250 LAN	581.40
SMART 500 LAN	309.09	Isobar 4 OUTLET	38.95
SMART 600 LAN	323.49	Isobar 6 OUTLET	46.38
SMART 750 LAN	403.99		

PCMCIA

3Com Etherlink II combo	246.15
BOCA 14.4K DATA/FAX	209.45
DATARACE 14.4K W/FAX	238.24
DATARACE 2400 W/FAX	168.70
DSP Tech Portable Sound+	154.34
EAGLE NE200C ETHERNET COAX	238.45
EAGLE NE200T ETHERNET	208.49
IBM TOKEN RING 16/4	447.57
INTEL 9600 W/FAX	199.96
INTEL 14.4 W/FAX	209.38
INTEL 24/96 W/FAX	128.92
LINKSYS ETHERNET 10BT	175.15
LINKSYS ETHERNET COAX	175.15
MAXTOR MOBILEMAX 105MB HD	379.92
MEGAHERTZ 14.4 W/FAX	216.70
MEGAHERTZ GOLD 14.4 XJACK W/FAX	229.00
MEGAHERTZ 2400 XJACK W/FAX	98.60
MEGAHERTZ 9600 XJACK W/FAX	179.70
MINISTOR 42MB HARD DRV	296.25
Motorola 14.4K w/cellular	419.00
NAT SEMI NE4100T ETHERNET 10BT	172.96
T. CONRAD ETHERNET COAX	228.44
TRANTOR SLIM SCSI-2	279.45
TURTLE BEACH Audio Advantage	129.38
USR WORLDPORT 14.4 W/FAX	209.90
XIRCOM TOKEN RING ADAPTER	449.18
HAYES OPTIMA 14.4 W/FAX	267.70
XIRCOM ETHERNET 10BT	228.74
XIRCOM ETHERNET COAX	226.36
XIRCOM ETHERNET COMBO	253.55

MEMORY UPGRADES

CDW® Features Delkin, Kingston, Pacific Data and Simple Technology Memory.

AST BRAVO 486LC 2MB	CALL!
AST POWEREXEC 486 4MB	CALL!
AST PREMIUM II 1MB CUPID SIMM	CALL!
AST PREMMIA 8MB UPG	CALL!
COMPAQ DESKTOPS-ALL MODELS	CALL!
COMPAQ CONTURA 486 8MB	CALL!
COMPAQ CONTURA 4MB	CALL!
COMPAQ LITE 4/25C 4MB	CALL!
EPSON ACTION LASER 2-8MB	CALL!
HP DESKJET 500 & 500C 256KB	CALL!
HP LASERJETS-ALL MODELS	CALL!
HP PAINTJET XL300 4MB	CALL!
IBM DESKTOPS-ALL MODELS	CALL!
IBM THINKPAD 700 4MB	CALL!
NEC SILENTWRITER 95 2MB	CALL!
NEC VERSA 4MB	CALL!
OKILASER 400 2MB	CALL!
OKILASER 800 2MB	CALL!
PANASONIC 4410, 4430 2-4MB	CALL!
PANASONIC P4450I 2MB	CALL!
TI MICROLASER 1MB	CALL!
TI TM4000 4MB	CALL!
TOSHIBA NOTEBOOKS-ALL MODELS	CALL!

Please Call CDW for the Best, Most Current Pricing and Availability Information.

PROCESSOR/UPGRADES

CYRIX 486DRX/2 Upg 40Mhz	247.44
INTEL DX2/50 OVERDRIVE	296.61
INTEL DX2/66 OVERDRIVE	332.05
KINGSTON SX/NOW 25MHZ	169.16
KINGSTON SX/NOW 33MHZ	196.25
KINGSTON 486/NOW 33MHz	255.52
KINGSTON 486/NOW 33MHZ	438.30

MATH COPROCESSORS

INTEL 387SX 16/20/25MHZ	76.84
INTEL 387SX 33MHZ	89.63
INTEL 387SL	76.22
INTEL 387DX	79.83

COMPUTER DISCOUNT WAREHOUSE™

CDW Computer Centers, Inc.
1020 E. Lake Cook Road
Buffalo Grove, IL 60089

CDW® Sells for Less and Services You Better!

(800) 865-4CDW

FAX (708) 465-6800

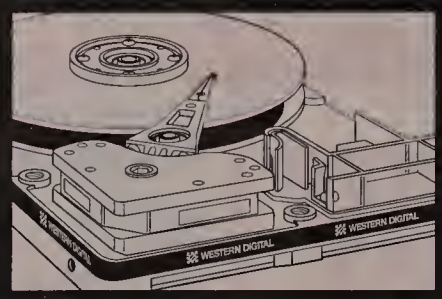
©1994 CDW® Computer Centers, Inc. PCW1015

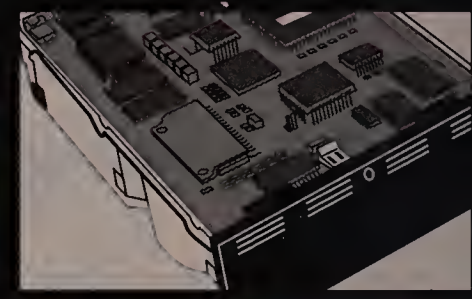
CALL FOR FREE CDW® CATALOG

Circle 68 on reader service card

MEGAHAUS HARD DRIVES

Your Drive Company!





UNEQUALED REPUTATION

Nobody knows drives like MegaHaus. We have specialized in storage solutions for over 8 years. Repeat business from satisfied customers is the backbone of our business. We satisfy our customers.

DIRECT REPLACEMENT WARRANTY

During the first year of your warranty, we replace: not repair, any defective items. All items receive lifetime technical support from our factory trained techs.

SAME DAY SHIPPING

Our multi-million dollar inventory offers you the best diversity and availability in the market. We ship most orders the same day. Each order is checked at least four times for accuracy.

FAST, EASY INSTALLATION

Anyone can sell you a hard drive. We sell easy to install storage solutions. We spend countless hours researching the best solutions, then create our quick precise installation guides for each kit.

UNBEATABLE DEALS

WESTERN DIGITAL

#1 IDE drives. 3 year warranty, 128K read / write disk cache. MegaHaus unbeatable price!

420MB	12ms	WDAC2420	$225
540MB	12ms	WDAC2540	$315
730MB	10ms	WDAC2700	$425

MICROPOLIS

Best buy large capacity drives! 5 year advanced replacement warranty. MegaHaus unbeatable price! Choose IDE or SCSI.

1050MB	8.5ms	MC4110	$649
1740MB	10ms	MC2217	$899

Seagate

Baracuda drives, 7200rpm, 1MB buffer. FAST! MegaHaus unbeatable price! WIDE SCSI in stock.

1690MB	8ms	ST11950N	$1329
2139MB	8ms	ST12550N	$1499
4290MB	8ms	ST15150N	$2699

SyQuest

INCLUDES 1 FREE DISK!

The industry standard in removable media. 3 1/2" form factor. IDE interface, SCSI also available.

105MB	14.5ms	SQ3105A	$229
270MB	13.5ms	SQ3270A	$489

adaptec

#1 SCSI disk controllers. Includes EZ-SCSI.

16Bit	ISA	A1522BASIC	$119
16Bit	ISA	A1542CFBASIC	$225
32Bit	EISA	A2742ABASIC	$319

IBM

Quality IDE hard drives, 3yr wty, 4500rpm.

364MB	12ms	70G8488	$235
527MB	12ms	70G8486	$329
728MB	12ms	70G8511	$399

HARD DRIVES

CONNER

IDE			
210MB	14ms	CFS210A	$195
420MB	14ms	CFS420A	$245
541MB	12ms	CFA540A	$339
811MB	10ms	CFA810A	$499
1080MB	9ms	CFP1080A	$599

Maxtor

IDE			
170MB	15ms	7170A	$195
540MB	12ms	7546A	$299

MICROPOLIS

IDE			
1050MB	10ms	MC4110A	$649
1740MB	10ms	MC2217A	$899
SCSI			
1052MB	8.5ms	MC4110	$649
1740MB	10ms	MC2217	$899
3020MB	11ms	MC1936	$1899
SCSI-AV Audio / Visual tuned drives			
1000MB	10ms	MC2210AV	$749
1700MB	10ms	MC2217AV	$999
3000MB	11ms	MC1936AV	$2119

Seagate

IDE			
213MB	16ms	ST3243A	$185
260MB	16ms	ST3290A	$216
341MB	13ms	ST3391A	$238
420MB	14ms	ST3491A	$253
545MB	12ms	ST5660A	$349
SCSI (WIDE SCSI also available)			
1690MB	8ms	ST11950N	$1325
1700MB	9ms	ST11900N	$1089
2145MB	8ms	ST12550N	$1499
2148MB	9ms	ST12400N	$1199
4290MB	9ms	ST15230N	$2299
4290MB	8ms	ST15150N	$2699

WESTERN DIGITAL

IDE			
341MB	12ms	AC2340	$219
425MB	12ms	AC2420	$225
540MB	11ms	AC2540	$315
730MB	10ms	AC2700	$425
1083MB	10ms	AC31000	$599

HARD DRIVES

Quantum

IDE			
270MB	12ms	LPS270A	$219
342MB	12ms	LPS340A	$249
541MB	12ms	LPS540A	$329
SCSI			
170MB	14ms	ELS170S	$199
270MB	12ms	LPS270S	$239
342MB	12ms	LPS340S	$265
541MB	12ms	LPS540S	$355
1080MB	10ms	IMP1080	$675
1440MB	9.5ms	IMP1440S	$885
2160MB	9.5ms	IMP2160S	$1199

IBM

SCSI (WIDE SCSI also available)			
1052MB	8.6ms	0662S12	$689
2040MB	9.2ms	0664N1H	$1199
4250MB	11ms	0664CSH	$2239

IBM PS/1 PS/2 DRIVES

Complete solutions for your IBM. Larger sizes in stock!

	210MB	420MB	540MB
PS/1 386 & 486	$299	$399	$499
PS/2			
25, 30, 30-286	$299	$399	$499
35 & 40	$269	$369	$469
50 thru 95	$399	$499	$599

CONTROLLER CARDS

ADAPTEC	Alone	w/Drive
A1522BASIC 16Bit SCSI	$119	$109
A1542CBASIC 16Bit SCSI	$225	$215
A2742 EISA SCSI	$319	$309
A2842 VESA SCSI	$279	$269
FUTURE DOMAIN		
1680SVP 16Bit SCSI	$155	$139
QLOGIC		
PCI SCSI & WIDE	$325	$309
ALPHA RESEARCH CACHING CARDS		
S425I 16Bit IDE	$99	$89
S475I 32Bit Local Bus IDE	$139	$129
S485I 32Bit PCI IDE	$229	$219
S425S 16Bit SCSI	$229	$219
S475S 32Bit Local Bus SCSI	$369	$359

Many other types of controllers in stock.

CD ROM DRIVES

NEC	CDR900	4X	180ms	$939
NEC	CDR510	3X	195ms	$369
Plextor	PX43CH	4X	150ms	$475
Toshiba	XM3401	2X	200ms	$269
Toshiba	XM4101	2X	320ms	$219
Teac	CD50	2X	265ms	$209

Pioneer External CD Changers (300ms)

DRM602X	6 disc	307KB/sec $869
DRM604X	6 disc	612KB/sec $1149
DRM1804X	18 disc	612KB/sec $2099

MULTIMEDIA KITS

SCSI Drive, sound card (in retail pkg)
MV=Media Vision Pro Audio 16. MS=Media Vision Pro Studio 16
SB= Sound Biaster 16 SCSI. SA= Sound Blaster SCSI ASP.

	MV	MS	SB	SA
XM4101	$330	$349	$359	$425
CD50	$330	$349	$359	$425
XM3401	$399	$419	$425	$479
CDR510	$489	$525	$529	$589
PX43CH	$629	$649	$659	$699
CDR900	$1099	$1119	$1129	$1189

CD ROM TOWERS

CD ROM Drive Towers - Multiple CD ROM drives in a single external enclosure. Great for networks, BBS, or business.

	2 Drive	4 Drive	7 Drive
XM4101	$569	$1199	$1999
CD50	$569	$1199	$1999
XM3401	$669	$1499	$2499
CDR510	$859	$1899	$3299
PX43CH	$1089	$2529	$4299
CDR900	$2119	$4339	$7489

BUNDLE SPECIALS WITH ANY CD DRIVE PURCHASE!

Free $25 ADI Photo CD processing coupon with each CD ROM Drive!
6 Title CD Bundle $69
Illustrated Encyclopedia, World Atlas, Mavis Beacon Teaches Typing, San Diego Zoo's Animals, US Atlas, Chessmaster 3000)
Caddies $5 Macintosh CD Driver $29
Altec Lansing ACS-100 Speakers $109

TAPE DRIVES

IOMEGA

250MB Tape Drive 5YR Warranty!
QIC-80 compatible, includes backup software & 1 FREE tape

	Alone	w/drive
Internal fits 3.5 or 5.25 bay	$159	$149
External for printer port	$319	$309

3 Pack of IOMEGA formatted DC2120 tapes $40 with any purchase!

SCSI Tape Drives - Kits include 16bit card, software & 1 tape

			Bare	Kit
750-1.5Gig	Exabyte	2501	$499	$699
2Gig	Conner	4320	$749	$899
2Gig	HP	35470	$889	$999
4-8Gig	Conner	4324	$999	$1109
4-8Gig	HP	35480	$989	$1099
4-16Gig	Sony	SDT5000	$1029	$1169
4-16Gig	HP	C1533A	$1379	$1579

OPTICAL DRIVES

Smart STORAGE SOLUTIONS

High quality, High Performance optical drive solutions include controller, and 1 disk. Get "Dare to Compare" FAX
128MB $769 230MB $969 1300MB $2299
HP & Maxoptix drives & media in stock.
Verbatim Optical Media (Qty 5 price)
128MB / 650MB / 1.3Gig $35 / $77 / $105

HARD DISK CARDS

Drive & controller on card. Saves drive bay. Compatible with XT, AT, Tandy, PS/2 and others. Super easy installation! IDE
210MB $299 420MB $399 540MB $499

MISCELLANEOUS

	Alone	w/HD
TEAC Floppy Drives		
Floppy 1.4 (1.2 + $9)	$45	$42
Floppy Combo 1.2 & 1.4	$115	$105
Maxtor 105MB PCMCIA drive		$429
PCMCIA to SCSI adapter		$319

Desktop Docking Module! Mounts in 5 1/4" drive bay. Allows you to use any PCMCIA in your desktop $159

MEGAHAUS HARD DRIVES
1110 NASA Rd 1 #306
Houston, Texas 77058

1-800-786-1154

Ad. Code # PW91 Sales Hours (Central Standard Time)
8am - 7pm Monday thru Friday 9am - 3pm Saturday
FAX (713) 333-3024 Local (713) 333-1910
We sell within the United States, its territories, and Canada (sorry no international orders)

VISA MasterCard DISCOVER AMERICAN EXPRESS

NO SURCHARGE

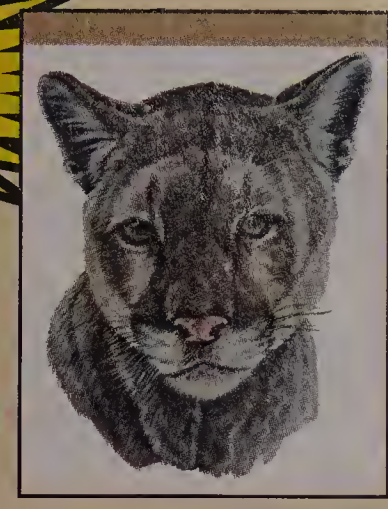
We accept Fortune 500 & Government bids & PO's.
We check for COD and Credit Card fraud!

Prices & specifications subject to change without notice. Shipping charges are nonrefundable. Returns must be in new condition and in original packaging. Delayed items may not be returnable. No refunds on software or special orders (items not listed in ad.) All refunds subject to 15% restocking fee. Some exceptions may apply to unbeatable deals. All trademarks are registered trademarks of their respective companies. Personal checks held for clearance. We reserve the right to refuse any sale for any reason. ©1994 MegaHaus Inc.

Circle 147 on reader service card

Before You Order Any Accounting Software, Can It Do This?

New 9.0 Version



"Readers' Choice" – Computer Monthly
"Best Buy" – Computer Shopper

NEW 9.0 FEATURES

- ✔ Notepads for all master records.
- ✔ Tips N Tricks — troubleshooting program
- ✔ Promo Pricing by date
- ✔ Screen paging
- ✔ Macro ability
- ✔ Five lines of Inventory description
- ✔ Pricing per customer ... AND MORE ...
- ✔ Fully Integrated — all modules.
- ✔ Allows bookkeeping for 250 companies with consolidation.
- ✔ Add on the fly (customers, vendors, inventory, G/L accounts, employees, etc.).
- ✔ Plain paper or user defined formats.
- ✔ Date sensitive system — allows 15 open periods.
- ✔ Context sensitive help — one key help that the user can modify.
- ✔ Import/Export capability from all modules.
- ✔ Complete posting audit trail.
- ✔ Easily upgrades to networks and/or UNIX.
- ✔ Flexibility to handle small to large businesses.
- ✔ Allows up to 15 alphanumeric characters for account numbers in all modules.
- ✔ Auditibility emulated by accounting software costing thousands more. CPAs love our audit trail.

"The power of your accounting software is in the flexibility and integrity if offers you. Dollar for dollar, feature for feature, benefit for benefit, this is the best value in the accounting market. You can spend a lot more money, but you can't get a better accounting value."
— Bob Gossett, G.M.

"Cougar Mountain's superb integrated accounting easily handles my accounting, both retail and wholesale very adequately. It beats accounting software that costs thousands of dollars more."
— Jim Frederick, C.P.A.

"I recommend accounting packages, so I keep 25 different packages on-hand and up-to-date. I find the best of all is Cougar Mountain Software. The pre-sets for different businesses make it really easy to install." — Joe Plouffe, C.P.A.

GENERAL LEDGER

- User defined numbering of accounts with up to 15 alphanumerics.
- Allows multiple departments.
- Allows transaction posting to prior or future financial periods.
- Standard G/L financials provided.
- G/L Report Writer with which user can design up to 250 financial reports per company.
- Allows recurring journal entries.
- Allows multi company ledgers with or without consolidation.

ACCOUNTS RECEIVABLE

- Allows open item or balance forward accounting.
- Allows recurring transactions.
- Prints user defined or plain paper statements.
- Handles cash receipts and partial payments.
- Ages receivables with user defined periods.
- Prints mailing labels, 1 to 4 across.
- Payments can apply to up to 250 invoices.
- Provides aged report by payment date.
- Customer file shows: credit limit, collections status, finance charge, YTD charges and YTD payments.
- Reports can be sorted by: customer number, customer name, customer type, zip code, salesperson code or biller code.

ACCOUNTS PAYABLE

- Prints checks.
- Calculates early payment discounts.
- Ability to distribute to 250 G/L expense accounts per invoice.
- Cash flow analysis/forecast.
- Allows entry of prepaid invoices to be expended later.
- Prepares check register of all payment transactions.
- Accounts for prepaid expenses (i.e. insurance).
- Allows immediate checks (hand-written or printed).
- Provides aged reports by payment date.
- Prints 1099s miscellaneous.
- Checks for duplicate transactions.
- User can design up to 9 check formats.

ORDER ENTRY

- Allows adding stock items and customers on the fly.
- Allows real time update of inventory.
- Invoice for sales and/or service (allows billing for non-stock, special order items).
- Complete detail sales reports with user defined sorts.
- Hold order feature (quotes on unfilled orders).
- Allows customer credit limits and alerts to exceeded limits.
- Allows for cost of non-inventory and special orders.
- User-defined tax sales rates.
- Produces back order report by customer.
- Displays customer balance during invoicing.
- Allows recurring invoices.
- Allows price level lookup during invoicing.
- Over 15 Order Entry reports (sales analysis, history, etc.).

PURCHASE ORDER

- Add vendors and inventory on the fly.
- Generates purchase orders from understock inventory items.
- Tracks multiple vendors for each stock item.
- Lists economical order quantity.
- Allows reprinting of purchase order.
- User defined purchase order formats.
- Tracks promised date vs. actual date; quoted cost vs. actual cost.

PAYROLL

- Calculates taxes.
- Allows user to update federal, state, and local tax tables.
- Allows for 18 pay rates per employee.
- Prints W-2s, 941 and quarterly reports.
- Submit W-2 on disk or magnetic media.
- Allows per-diem pay, contract, piece work, hourly and salary.
- Multi-company payrolls.
- Prints checks.
- Allows "after the fact" payroll.
- Allows benefits and deductions on fixed amount, unit amounts, percentage of gross or variable amount.
- Allows 22 user-defined benefits and deductions per employee.
- Allows 401K, cafeteria plans.
- Supports any user-defined pay periods from 1 to 52, including daily.
- Over 22 payroll reports.

CHECK RECONCILIATION

- Single or multiple bank accounts.
- Prints user-defined checks.
- Sort by voided, stop payment, deposit sources.
- Allows recurring transactions.
- Allows reconciliations either from checkbook or bank statement.
- Retains check register for 100 years.
- Sorts checks by number, date, payee, vendor or employees.

INVENTORY

- Minimum/maximum quality levels (reorder points).
- Look-up by number or description.
- Allows quantity decimal precision up to four places.
- Supports up to 5 quantity price/break price levels on each item.
- Provides bill of materials processing (kits and manufacturing).
- Provides purchase and sell conversions.
- Prints user-defined inventory labels.
- Supports LIFO, FIFO, weighted average, or standard costing with standard inventory reports.

LYNX (ASCII file converter)

- Allows importing and exporting data files (file formats provided).

Only **$199.50** plus shipping & handling

TOTAL PACKAGE PRICE
Toll-Free Support & Training Seminars Available

ADDITIONAL PRODUCTS FROM COUGAR MOUNTAIN SOFTWARE

Data Query

- Optional data query module for the user who needs more than ACT Plus's 250 standard reports. Provides user with the ability to generate a multitude of custom reports using data from any ACT Plus file. Custom design unique reports and avoid the costs and lengthy timeframe of custom programming.

Special savings when you purchase ACT Plus with CMS Data Query module as a single unit. Bonus buy, reg. $399.00. Special Price: **$349.50** plus Shipping and Handling.

Point-of-Sale

- Optional point-of-sale module integrates to ACT Plus to capture data from the front end sales operation, and transfers it to the back office accounting package. This enables the user to know daily where things stand with inventory, sales, accounts receivable, accounts payable, profit and loss, etc. The POS module works with all kinds of electronic point-of-sale peripheral equipment, such as cash drawers, bar code readers, scanners, and more.
- **Job Costing for estimating, work-in-progress, phases, overhead, and sub-contracting, integrates with ACT Plus.**
- **Powerful FUND accounting designed to accomodate non-profit organizations and institutions.**

Cougar Mountain Software

2609 Kootenai St
PO Box 6886
Boise, ID 83707
(208) 344-2540
(208) 343-0267 Fax

We're so sure you'll love our accounting package, we offer a 60-day money-back guarantee. If, for any reason, you are not happy with your purchase, we will refund your money.
A 15% restocking fee applies.

Call **1-800-388-3038** today
to order the best buy of the year on business accounting.

Circle 56 on reader service card

Call today for your FREE newsletter

"Fix any PC...FAST!"™

Get data back from crashed drives, FAST!

*"Rescue works better than Norton Utilities or PC Tools." - **The ThinkTank***

RESCUE Data Recovery Software™ is the first program to easily recover lost data from crashed floppies & hard drives even when DOS can't read them! RESCUE recovers data other recovery programs cannot. RESCUE automatically recovers DOS & Windows files including data from compressed drives. Be prepared for any problem. RESCUE is the insurance and security you need to safeguard your valuable data. Call now, don't wait until your data is lost, forever!

Troubleshoot any PC Problem, FAST!

*"If you support PC's, The Troubleshooter is likely to become one of your most important tools..." - **Infoworld***

The Troubleshooter™ is the most advanced PC dignostic software available that really finds the bugs. The Troubleshooter bypasses DOS & tests all major hardware components directly for true accuracy while other programs often give erroneous test results! Loaded with all the tests you'll need to accurately isolate the source of PC failures! • The Discovery Card™ is the only accurate way to 100% resolve DMA and IRQ conflicts. • The PocketPost™ debugs even dead PCs that won't boot. Get all three in a kit to keep any PC out of trouble. Call now for specs & special package pricing!

Fix Windows, FAST!

*"A model of elegance and clarity. Skylight stands out.The Editor's Choice is Skylight!" - **PC Magazine***

Having problems with Windows? Skylight™ is the answer! Concise reporting and troubleshooting on Windows problems and conflicts makes Skylight a must have for any Windows user. Maximize speed and performance with PC Magazine's #1 Rated Windows Troubleshooting Tool. Call today for pricing!

Install, set-up & maintain hard drives, FAST!

*"DrivePro makes installing & maintaining hard drives practically fool proof." - **PC World***

DrivePro™ provides fast, precise installation and maintenance for any hard drive. Override BIOS limitations for user-definable drive types. DOS format any size hard drive in under 30 seconds. IDE drives can be installed in less than 60 seconds. Allows the use of IDE drives with MFM/RLL or ESDI drives in the same system. Retrieves the manufacturers' recommended specs from the drive itself, plus much more! Call now for pricing!

Vital hardware specs & information, FAST!

*"A gold mine for anyone who supports PCs." - **Computer Shopper***

The Technical Library on CD-Rom™ is compiled from over 50,000 pages of technical hardware manuals! Contains complete configurations, specifications, diagrams, settings, component locations and other vital hardware technical information all at your fingertips on CD-ROM. Includes main boards, network interface cards, hard drives, controller and I/O cards. A must for any service department. Call today for special pricing!

Call today for your FREE newsletter

"Fix any PC...FAST!"

and learn how to resolve...

- Drive Crashes/Data Loss
- IRQ/DMA Conflicts
- Intermittent Failures
- Overheating
- Power Problems...and more!

Free Technical Support • Next Day Shipping • Performance Guaranteed

(800) 653-4933

MasterCard VISA AMERICAN EXPRESS

International: (813) 539-7283
Fax: (813) 531-0200

AllMicro,Inc.
18820 U.S. Hwy. 19 N, #215
Clearwater, FL 34624

PC

© 1994 AllMicro, Inc. Fix Any PC Fast, Rescue Data Recovery Software, The Discovery Card, and The Troubleshooter are trademarks of AllMicro,Inc. All Rights Reserved.
Other names are trademarks of their associated owners. Specifications subject to change without notice. Some system failures may be beyond repair.

Circle 31 on reader service card

PC POWER

intel inside
pentium

POLY 586-90
From $3850.00

POLY 586-66
From $2850.00

POLY 4586-66
From $1850.00

Polywell Computers gives you more Power to Speed!

- Top Of The Line for the Power User
- A Complete PC Solution for the Graphics Professional
- Budgeted Systems for Consultant & Home Studio
- Custom Configured for the Best Compatability

As a professional you should never have to wait for your system to perform. Time is Money. That's why we at Polywell custom configure the architecture and design of every Polywell system to your specifications.

Call for information on your choice of 386, 486 & 586 custom configured to your needs.

800-300-POLY (7659)
Tel 415-583-7222 Fax 415-583-1974

POLY POLYWELL SYSTEMS

Locked into The Future!

Polywell Computers, Inc.
1461- 1 San Mateo Ave.
South San Francisco,
CA 94080 USA

PC WORLD BEST BUY DEC. 1993 · PCComputing HARDWARE 200 JUNE 1993 · BYTE RECOMMENDED SEPT 1992 · PCComputing HARDWARE 200 FINALIST JUNE 1994 · INFO WORLD 100 NOV 1989 · PC WORLD BEST BUY MAY 1993 · PC WORLD BEST BUY SEPT 1993 · PC MAGAZINE EDITOR'S CHOICE JULY 1990 · MICROSOFT WINDOWS READY TO RUN · yes NetWare Tested and Approved · Autodesk ADI DEVELOPER · Feb 1993 · PC WORLD BEST BUY APRIL 1994

Circle 227 on reader service card

Eco-Logical.

This symbol identifies energy-efficient computers that save you money and reduce air pollution by "powering down" when not in use.

Over 2000 computers, monitors and printers have earned the right to bear the Environmental Protection Agency's Energy Star℠ logo. These computers are so smart, they go to sleep when not in use and wake up with a simple touch of the keyboard or mouse. Energy Star℠ Computers don't cost any extra, will save money on your energy bill, and prevent pollution from electricity generation. Be part of the solution and look for this logo when you make your next computer purchase. To receive a list of available products call the Energy Star℠ Hotline at 202 775-6650.

Buy It And Save.

FREE PRODUCT INFORMATION PC WORLD

NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

PHONE ( ) FAX ( )

INFORMATION FROM ADVERTISERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

☐ Check this box for your subscription to *PC WORLD*. You will be billed $19.97 for a 1-year (12 issue) subscription (U.S. only).

Circle the number corresponding to the product or product category you need to know more about. Mail or fax the completed card today. Manufacturers will send product information directly to you. Fax to (413) 637-4343.

PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

9/94

PRODUCT CATEGORY INFORMATION

For information on all of the products mentioned in an article or an entire category of advertised products, circle the appropriate number below.

Editorial Features (see article for numbers)

901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920

Advertised Products

951 Desktop computers
952 Notebook computers
953 DTP/Presentation software
954 Monitors and video boards
955 Accounting software
956 Draw/paint software
957 Network/sharing products
958 Printers
959 Multimedia products
960 Utilities
961 Mail order companies
962 Storage devices

September 1994 This card expires January 12, 1995 N1

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

Free Product Information

For quicker response, fax to (413) 637-4343.

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 758 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD
Product Information Center
P.O. Box 5330
Pittsfield, MA 01203-9871

FREE PRODUCT INFORMATION PC WORLD

NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

PHONE ( ) FAX ( )

INFORMATION FROM ADVERTISERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

☐ Check this box for your subscription to *PC WORLD*. You will be billed $19.97 for a 1-year (12 issue) subscription (U.S. only).

Circle the number corresponding to the product or product category you need to know more about. Mail or fax the completed card today. Manufacturers will send product information directly to you. Fax to (413) 637-4343.

PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

9/94

PRODUCT CATEGORY INFORMATION

For information on all of the products mentioned in an article or an entire category of advertised products, circle the appropriate number below.

Editorial Features (see article for numbers)

901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920

Advertised Products

951 Desktop computers
952 Notebook computers
953 DTP/Presentation software
954 Monitors and video boards
955 Accounting software
956 Draw/paint software
957 Network/sharing products
958 Printers
959 Multimedia products
960 Utilities
961 Mail order companies
962 Storage devices

September 1994 This card expires January 12, 1995 N3

Free Product Information

For quicker response, fax to (413) 637-4343.

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 758 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD

Product Information Center
P.O. Box 5330
Pittsfield, MA 01203-9871

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

FREE PRODUCT INFORMATION PC WORLD

NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

PHONE ( ) FAX ( )

INFORMATION FROM ADVERTISERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

☐ Check this box for your subscription to *PC WORLD*. You will be billed $19.97 for a 1-year (12 issue) subscription (U.S. only).

Circle the number corresponding to the product or product category you need to know more about. Mail or fax the completed card today. Manufacturers will send product information directly to you. Fax to (413) 637-4343.

PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

9/94

PRODUCT CATEGORY INFORMATION

For information on all of the products mentioned in an article or an entire category of advertised products, circle the appropriate number below.

Editorial Features (see article for numbers)

901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920

Advertised Products

951 Desktop computers
952 Notebook computers
953 DTP/Presentation software
954 Monitors and video boards
955 Accounting software
956 Draw/paint software
957 Network/sharing products
958 Printers
959 Multimedia products
960 Utilities
961 Mail order companies
962 Storage devices

September 1994 This card expires January 12, 1995 N2

Free Product Information

For quicker response, fax to (413) 637-4343.

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 758 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD

Product Information Center
P.O. Box 5330
Pittsfield, MA 01203-9871

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

PC WORLD

PUBLISHER & COO Richard J. Marino

Assistant to the Publisher & COO Colette Cornish

ADVERTISING SALES

Vice President, Director of Advertising
Jeff Edman

Assistant to the Director of Advertising
Patricia Owen

EAST

Eastern Advertising Director
Bob Ostrow (508/820-0440)

Administrative Assistant/Office Manager
Ellen Sanderson

Mid-Atlantic/Manhattan
John Grogan, Senior Account Manager (201/587-0090)

Wayne Silverman, Account Representative (201/587-0090)

New England/Ohio/Michigan/ Eastern Canada
Michael Welsh Carroll, Account Manager (508/820-0440)

Southeast/Pennsylvania
Judy Sutter, Senior Account Manager (404/394-0758)

MIDWEST

Midwestern Advertising Director
Mark Taussig (708/827-4477)

Administrative Assistant
Tammy Torp

Midwest/Texas
Harvey Diamond, Senior Account Manager, National Direct Account Manager (214/233-3492)

Midwest
Duane Hampson, Account Representative (415/243-0500)

NORTHWEST

Northwestern Advertising Director
Bob Carrigan (415/243-0500)

Administrative Assistant
Jane Basco

San Francisco Bay Area (Area code 415 & 510)
Corinne Cox, Account Manager (415/243-0500)

San Jose, CA (Area code 408)/Oregon
William M. Giller, Account Manager (415/243-0500)

SOUTHWEST

Southwestern Advertising Director
Greg Mason (415/243-0500)

Administrative Assistant
Julie Dunn

Southern California (San Diego), Colorado/Idaho/Nevada/Utah/ New Mexico/Arizona
Lisa Crutchfield, Account Manager (714/250-8081)

Southern California (Los Angeles County/ Orange County)
Bill Hanck, Account Manager (310/312-8008)

LOTUS EDITION ADVERTISING SALES

Kevin Normandeau, Account Representative (508/820-8113)

SPECIAL PROGRAMS

Director of Strategic Markets
Susan Simmons (415/243-0500)

PC WORLD CLASSIFIED

Classified Manager
Pat Fales (203/857-5115)

Eastern Account Manager
Katherine Noto (203/857-5101)

Western Account Manager
Janet Sawyer (203/857-5102)

PC WORLD ACTION CARDS

Account Representatives
Kevin Normandeau (508/820-8113)
Leslie Piper (415/243-0500)

PC WORLD REPRINTS

Reprints Coordinator
Leslie Piper (415/243-0500)

CIRCULATION, MARKETING, RESEARCH

Senior Vice President
Heather Martin Maier

Assistant to the Senior Vice President
Cristin Corbin

Circulation Director Shawne Burke Pecar

Circulation Business Manager
Noël McLaughlin

Sr. Promotion Manager
Ellen DiMatteo

Renewal and Billing Manager David Cobb

Single Copy Sales Manager
Cheryl Grover

Promotion Manager Jane Kratochvil

Circulation Assistant Chris Browning

Director of Marketing Alan Abrams

Public Relations Manager Lee Doyle

Marketing Events Manager Sandy Wong

Administrative Assistant Krista Alvarez

Research Director Cheryl Curbow

Sr. Research Analyst Scott Laughlin

Research Analyst Kate Collins

PRODUCTION

Vice President, Manufacturing
Linda Manes Goodwin

Senior Production Manager
Nadia Maudsley

Advertising Information Manager
Mike Wallace

Assistant Production Managers
Kathy Badertscher, Nancy Jonathans

Advertising Production Coordinator
Francis Aviani

Advertising Information Assistant
Jon Friesch

INTERACTIVE FAX PRODUCTS

Manager Zornitza Stefanova

Technical Systems Administrator
Adam Block

HUMAN RESOURCES

Vice President Richard Willoughby

Manager Thalia Ohara

Assistant Maria Chico

ADMINISTRATION

Vice President, Finance Vicki Peilen

Director of Information Systems
Wally Clegg

Information Systems Manager
Norman Noble

Corporate Business Manager
Christina Spence

Accounting/Operations Manager
Pat Murphy

Accounting/Facilities Manager
Michelle Reyes

Senior Financial Analyst
Madeleine Buckingham

Assistant to the President Kelly Milan

Advertiser Index A-Z

Get more information—circle the appropriate number on the reader service card.

Reader Service Number		Page Number
102	Acer America Corporation	128-129
66	Acma Computers Inc.	171
23	Adobe Systems	236
9	Advanced Logic Research Inc.	11
31	All Micro	314B
–	Ambra Computer Corporation	109-116
–	Ambra Computer Corporation	2, 3
4S	American Power Conversion	48-49
8	Arlington Computer Products	310
–	AST Research	22-23
–	AST Research	52-53
4	AT&T	261
S	ATI Technologies	169
22	Austin Computer Systems	45, 46
41	Austin Hayne	272
63	Borland	28-29
–	Canon	228
103	Charles Schwab	223
47	Compaq	225-227
88	Compaq	118-119
3S	Compaq	284-285
83	Compaq Direct Plus	195
61	Compaq Direct Plus	54-55
73	CompuAdd Corporation	50
33	CompuServe	94
68	Computer Discount Warehouse	311-313
67	Corel Systems	34
48	Corel Systems	275
S6	Cougar Mountain Software	314A
74	CTX International	263
–	Cuttis	125
94	Datastorm Technologies Inc.	215
–	Dell Computer Corporation	C5-C8
–	Dell Computer Corporation	65-79
49	Delphi	205
99	Delrina Technology Inc.	31
146	Delrina Technology Inc.	33
37	Delrina Technology Inc.	35
–	EcoLogical	314D
101	ElseWare Corporation	21
–	Epson America	26-27
82	Executrain Corporation	253
107	First International Computer/Everex	271
1S3	Fujitsu	252
111	Fusion Software	277B
–	Gateway 2000	81-93
	Hewlett-Packard	130-131
–	Hewlett-Packard	38-39
–	IBM Corporation	265
142	IBM PC Co.	8
–	IDG Books Worldwide, Inc.	320
132	In Focus Systems Inc.	201

PC World is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 190 computer publications in 62 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: **ARGENTINA**'s Computerworld Argentina, Infoworld Argentina; **ASIA**'s Computerworld Hong Kong, Computerworld Malaysia, Computerworld Southeast Asia, PC World Hong Kong, PC World Malaysia, PC World Singapore; **AUSTRALIA**'s Australian Macworld, Australian PC World, Computerworld Australia, IDG Sources, Network World, Reseller; **AUSTRIA**'s Computerwelt Oesterreich, PC Test; **BRAZIL**'s Computerworld, Mundo IBM, Mundo Unix, PC World, Publish; **BULGARIA**'s Computerworld Bulgaria, Ediworld, PC & Mac World Bulgaria; **CANAOA**'s Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; **CHILE**'s Computerworld, Informática; **COLOMBIA**'s Computerworld Colombia; **CZECH REPUBLIC**'s Computerworld, Elektronika, PC World; **OENMARK**'s CAD/CAM World, Communications World, Computerworld Danmark, Lotus World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Windows World; **ECUAOOR**'s PC World; **EGYPT**'s Computer World (CW) Middle East, PC World Middle East; **FINLANO**'s MikroPC, Tietoverkko, Tietoviikko; **FRANCE**'s Distributique, Golden Mac, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Télécoms & Reseaux; **GERMANY**'s Computerwoche, Computerwoche Extra, Computerwoche Focus, Computerwoche Karriere, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; **HUNGARY**'s Alaplap, Computerworld SZT, PC World; **INDIA**'s Computers & Communications; **ISRAEL**'s Computerworld Israel, PC World Israel; **ITALY**'s Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC World Italia; **JAPAN**'s Computerworld Japan, Macworld Japan, SunWorld Japan, Windows World; **KENYA**'s East African Computer News; **KOREA**'s Computerworld Korea, Macworld Korea, PC World Korea; **MEXICO**'s Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; **THE NETHERLANOS'** Computerl Totaal, LAN Magazine, MacWorld; **NEW ZEALANO**'s Computer Listings, Computerworld New Zealand, New Zealand PC World; **NIGERIA**'s PC World Africa; **NORWAY**'s Computerworld Norge, C/World, IDG Direct Response, Lotusworld Norge, Macworld Norge, Networld, PC World Ekspress, PC World Norge, PC World's Product Guide, Publish World, Student Data, Unix World, Windowsworld; **PANAMA**'s PC World; **PEOPLE'S REPUBLIC OF CHINA**'s China Computerworld, China Network World, Electronics International, PC World China; **IOG HIGH TECH BEIJING**'s New Product World; **IDG SHENZHEN**'s Computer News Digest; **PERU**'s Computerworld Peru, PC World; **PHILIPPINES'** Computerworld, PC World; **POLANO**'s Computerworld Poland, PC World/Komputer; **PORTUGAL**'s Cerebro/PC World, Correio Informatico/Computerworld, Macln; **ROMANIA**'s PC World; **RUSSIA**'s Computerworld-Moscow, Mir-PC, Sety; **SLOVENIA**'s Monitor Magazine; **SOUTH AFRICA**'s Computing S.A.; **SPAIN**'s Amiga World, Computerworld España, Comunicaciones World, Macworld España, NeXTworld, PC World España, Publish, Sunworld; **SWEOEN**'s Attack, ComputerSweden, Corporate Computing, Datalngenjoren, Lokala Natverk/LAN, Lotus World, MAC&PC, Macworld, Maxi Data, Mikrodatorn, PC World, Publishing & Design (CAP), Windows World; **SWITZERLANO**'s Computerworld Schweiz, Macworld Schweiz, PC & Workstation; **TAIWAN**'s Computerworld Taiwan, Global Computer Express, PC World Taiwan; **THAILAND**'s Thai Computerworld; **TURKEY**'s Computerworld Monitor, Macworld Turkiye, PC World Turkiye; **UKRAINE**'s Computer World; **UNITED KINGDOM**'s Lotus Magazine, Macworld, Sunworld; **UNITED STATES'** AmigaWorld, Cable in the Classroom, CD Review, CIO, Computerworld, Desktop Video World, DOS Resource Guide, Electronic News, Federal Computer Week, Federal Integrator, GamePro, IDG Books, Infoworld, Infoworld Direct, Laser Event, Macworld, Multimedia World, Network World, NeXTworld, PC Games, PC Letter, PC World, Publish, Sumeria, SunWorld, SWATPro, Video Event; **VENEZUELA**'s Computerworld Venezuela, MicroComputerworld Venezuela; **VIETNAM**'s PC World Vietnam.

Index

Reader Service Number		Page Number
–	Intel Corporation	100-101
–	International Correspondence Schools	299
152	Iomega	273
138	KAO	10
90	Keystone Learning Systems	309
118	Kinesis Corporation	20
–	LA Trade	306
206	LearnKey	304-305
241	Logitech	249
–	Lotus	151-156
–	Lotus	16-17
–	Lotus	56-57
246	Lotus Publishing	250-251
126	Lyco Computer	301
169	MAG InnoVision	185
150	Mail Boxes Etc.	241
147	MegaHaus	314
157	Microcom	123
183	MicroGrafx	97
161	MicroHelp	217
217	Micron Computer, Inc.	12, 13
–	Microsoft	234
–	Microsoft	40-41
–	Microsoft	C2-1
200	Microsolutions Computer Products	24
172	MIS Corporation	302
–	Mobilink	238
194	Nanao USA Corporation	218
205	NEC	161
203	NEC	140-141
187	NEC	273A-B
–	NRI Schools	303
164	Ocean Isle Software	277A
–	Okidata	36
140	Okidata	37
233	Patton & Patton Software Corporation	276
–	PC Connection	188
–	PC Connection	187-189
181	PC World - Online Access Magazine	323
–	PC World Online/America Online	269-270
207	PC World Online/CompuServe	283
212	PKWARE Inc.	44
227	Polywell Computers	314C
–	QMS Inc.	32
–	QMS Inc.	257
211	Quantex	25
189	Quatterdeck	197
209	Rose Electronics	268
255	Sampo	199
198	Samsung Electronics	287
213	Samtron Displays, Inc.	103
236	Scitor Corporation	42
210	Shapeware Corporation	126-127
230	Sharp Electronics Corporation	139
144	Sharp Electronics Corporation	245
–	Software Publishing	147
253	SPSS, Inc.	99
–	Symantec Corporation	14
–	Symantec Corporation	164
124	Tektronix Inc.	167
154	Texas Instruments	179-181
244	Texas Instruments	212-213
–	The Computer Book Club	307
208	3M Data Storage	259
228	Toshiba America Inc.	247
81	Tripp Lite	80
154	U.S. Robotics	281
148	USA Flex	308
224	Viewsonic	18
218	Viewsonic	277
197	Win Book	143
238	Worldwide Technologies	300
192	Zenith Data Systems	104-105
193	Zeos International	9
216	Zeos International	242
260	Zeos International	267
237	Zeos International	6, 7

Advertiser Index by Product Category

Get more information—circle the appropriate number on the reader service card.

HARDWARE

Boards/Chips/Cards

5	ATI Technologies	169
–	Intel Corporation	100-101

Communications

–	Mobilink	238
154	U.S. Robotics	281

Computers

66	Acma Computers Inc.	171
9	Advanced Logic Research Inc.	11
–	Ambra Computer Corporation	109-116
22	Austin Computer Systems	45, 46
88	Compaq	118-119
61	Compaq Direct Plus	54-55
–	Dell Computer Corporation	C5-C8
–	Gateway 2000	81-93
	Hewlett-Packard	130-131
–	Hewlett-Packard	38-39
–	Intel Corporation	100-101
217	Micron Computer, Inc.	12, 13
172	MIS Corporation	302
227	Polywell Computers	314C
211	Quantex	25
216	Zeos International	242
260	Zeos International	267
237	Zeos International	6, 7

Input Devices

118	Kinesis Corporation	20
241	Logitech	249

Laptops/Notebooks

–	Ambra Computer Corporation	2, 3
–	AST Research	22-23
–	AST Research	52-53
22	Austin Computer Systems	45
22	Austin Computer Systems	46
35	Compaq	284-285
83	Compaq Direct Plus	195
–	Dell Computer Corporation	C5-C8
–	Dell Computer Corporation	65-79
107	First International Computer/Everex	271
–	Gateway 2000	81-93
187	NEC	273A-B
244	Texas Instruments	212-213
228	Toshiba America Inc.	247
197	Win Book	143
192	Zenith Data Systems	104-105
193	Zeos International	9

Local Area Networks

47	Compaq	225-227
209	Rose Electronics	268

Monitors/Displays

102	Acer America Corporation	128-129
74	CTX International	263
132	In Focus Systems Inc.	201
169	MAG InnoVision	185
194	Nanao USA Corporation	218
203	NEC	140-141
255	Sampo	199
198	Samsung Electronics	287
213	Samtron Displays, Inc.	103
224	Viewsonic	18
218	Viewsonic	277

Multimedia

132	In Focus Systems Inc.	201

Other

–	Curtis	125
144	Sharp Electronics Corporation	245

Peripheral/Sharing Devices

209	Rose Electronics	268

Power/Protection

45	American Power Conversion	48-49
81	Tripp Lite	80

Printers/Plotters

205	NEC	161
–	Okidata	36
140	Okidata	37
–	QMS Inc.	32
–	QMS Inc.	257
230	Sharp Electronics Corporation	139
124	Tektronix Inc.	167
154	Texas Instruments	179-181

Scanners/Digitizers

–	Canon	228
73	CompuAdd Corporation	50
–	Epson America	26-27
153	Fujitsu	252

Storage/Backup Devices

208	3M Data Storage	259
152	Iomega	273
147	MegaHaus	314
200	Microsolutions Computer Products	24

Systems

47	Compaq	225-227
217	Micron Computer, Inc.	12, 13

SOFTWARE

Accounting/Financial

103	Charles Schwab	223
56	Cougar Mountain Software	314A

Communications

94	Datastorm Technologies Inc.	215
157	Microcom	123
164	Ocean Isle Software	277A

Database Management

63	Borland	28-29
–	Lotus	16-17

Entertainment

111	Fusion Software	277B

Fontware

23	Adobe Systems	236
101	ElseWare Corporation	21

Graphics

4	AT&T	261
67	Corel Systems	34
48	Corel Systems	275
183	MicroGrafx	97
210	Shapeware Corporation	126-127

Integrated Software

–	Microsoft	40-41

Management

41	Austin Hayne	272
–	Symantec Corporation	14

Other

99	Delrina Technology Inc.	31
146	Delrina Technology Inc.	33
37	Delrina Technology Inc.	35

Presentation Graphics

–	Software Publishing	147

Project Management

233	Patton & Patton Software Corporation	276
236	Scitor Corporation	42

Spreadsheets/Templates/Forms

–	Lotus	56-57
–	Microsoft	234

Software Suites

–	Lotus	151-156
–	Microsoft	C2-1

Statistics

253	SPSS, Inc.	99

Utilities

31	All Micro	314B
161	MicroHelp	217
194	Nanao USA Corporation	218
212	PKWARE Inc.	44
189	Quatterdeck	197
–	Symantec Corporation	164

Video

90	Keystone Learning Systems	309

Windows

94	Datastorm Technologies Inc.	215
111	Fusion Software	277B

MISCELLANEOUS

Books/Periodicals/Subscriptions

–	IDG Books Worldwide, Inc.	320
–	The Computer Book Club	307

Mail Order

31	All Micro	314B
8	Arlington Computer Products	310
68	Computer Discount Warehouse	311-313
–	LA Trade	306
126	Lyco Computer	301
–	PC Connection	188
–	PC Connection	187-189
148	USA Flex	308
238	Worldwide Technologies	300

Online Services

33	CompuServe	94
49	Delphi	205
–	PC World Online/America Online	269-270
207	PC World Online/CompuServe	283

Other

–	EcoLogical	314D
246	Lotus Publishing	250-251
150	Mail Boxes Etc.	241

Service/Support

–	IBM Corporation	265
142	IBM PC Co.	8

Index

Products Featured in Editorial

Get more information—circle the appropriate number on the reader service card.

Accounting

Reader Service Number		Page Number
761	DacEasy Executive Information System in DOS, DacEasy	122
714	Peachtree Accounting 3.0 for Windows, Peachtree Software	107
–	QuickBooks 2.0 for Windows, Intuit	239

Add-On Board

683	Actix GraphicsEngine 64, Actix	182
694	ATI Graphics Pro Turbo, ATI	183
695	ATI Graphics Ultra Pro, ATI	183
684	ATI Graphics Xpression, ATI	182
678	Boca Voyager, Boca Research	182
685	Diamond Stealth 32, Diamond Computer	182
696	Diamond Stealth 64, Diamond Computer	184
697	Diamond Viper Pro, Diamond Computer	184
679	Elsa Winner 1000VL, Elsa	182
686	Genoa Phantom 32i, Genoa	183
687	Hercules Dynamite Power VL, Hercules	183
688	Hercules Dynamite Pro ISA, Hercules	183
698	Hercules Graphite Power VL, Hercules	184
699	Matrox MGA Ultima, Matrox	184
680	miroCrystal 10SD, miro	182
689	miroCrystal 20SD, miro	183
690	Number Nine #9GXE64, Number Nine Computer	183
700	Number Nine #9GXE64 Pro, Number Nine Computer	184
691	Orchid Kelvin 64, Orchid Technologies	183
681	Paradise VL Plus, Western Digital	182
682	STB Express PCI, STB	182
692	STB LightSpeed, STB	183
693	STB Nitro, STB	183
701	VideoLogic 928Movie, VideoLogic	184
702	VidTech GraphMax L12, VidTech	184

CD ROM Software

767	SelectPhone, Pro CD	117

Communications

810	Close-Up 6.0, Norton-Lambert	61
811	Kurzweil Voice for Windows 1.0, Kurzweil Applied Intelligence	62

Computer System

719	Acom Patriot 4000, Acom	135
720	Ambra D466I/VL, Ambra Computer	135
721	Ambra D4100I/VL, Ambra Computer	135
738	Ares DX4-100, Ares Microdevelopment	162
787	Ares PCI-VESA System, Ares Microdevelopment	68
775	AST Ascentia 800N, Ascentia 900N, Bravo MS, Premmia GX, Premmia MX; AST Research	95
722	AT&T Globalyst 200 (486DX2-50), AT&T Global Information Solutions	138
723	AT&T Globalyst 200 (486SX-33), AT&T Global Information Solutions	138
724	Austin P5-66, Austin Computer Systems	138
739	Compaq Deskpro XE 450, Compaq Computer	162
725	Compaq ProLinea 4/100 Model 525, Compaq Computer	142
726	CompuAdd C4100D, CompuAdd	142
727	CompuAdd CP60p, CompuAdd	142
740	DECpc XL560, Digital Equipment	162
728	DECpc XL590, Digital Equipment	146
778	Dell Dimension XPS MT, Dell Computer	98
729	Diamond DT 486-66, Diamond Technologies	146
730	Duracom TravelPro5110, Duracom Computer Systems	146
731	Empac Magnum, Empac Int'l	150
612	HP OmniBook 530 PC, Hewlett-Packard	240
741	Hyundai Neuron Lite 425SX, Hyundai	162
–	IBM ThinkPad 500, IBM	150
732	Identity Systems Select Series, Identity Systems Technology	150
733	Insight PCI P66 SCSI, Insight	150
734	MicroTech Ultima XVC/100, MicroTech Computer	157
735	MIS M5P/60, MIS Computer	157
736	MPC 380, MPC Technologies	157
737	NEC Image 4100es, NEC Technologies	159
777	Portégé T1960CS, T1960CT, T2400CS, T2400CT, T3600CT; Toshiba America	98
788	QMS 2001 Knowledge System PC, QMS	70
742	Wyse Forté GSV, Wyse Technology	162

Database Management

755	Office Accelerator, Baseline Data Systems	324

Educational

756	American Heritage Talking Dictionary, SoftKey International	122
760	TripMaker for Windows, Rand McNally	122

Entertainment/Game

616	Funny, Warner New Media	321
617	Sam & Max Hit the Road, LucasArts Entertainment	321
618	Star Trek 25th Anniversary CD ROM, Interplay	321

Fax-Modem

641	ATI 19200 ETC-I, ATI	202
642	AT&T DataPort 14.4/Datafax, AT&T	202
643	Best Data Products The Smart One 1442F, Best Data Products	202
644	Boca Research BocaModem V.Fast Class Internal, Boca Research	202
645	Cardinal Technologies MVP 192I, Cardinal Technologies	202
646	CMS Enhancements FM-144HVbis, CMS Enhancements	202
647	Computer Peripherals Viva 14.4i Internal Modem, Computer Peripherals	202
648	Data Race RediCard, Data Race	202
649	Digicom Systems Connection 14.4 DF, Digicom Systems	202
650	GVC 14.4 kbps Fax Modem, GVC	202
651	Hayes Accura 144B + Fax144, Hayes Accura 28.8 V.FC + Fax; Hayes	203
652	Intel Faxmodem, Intel SatisFaxtion Modem/400; Intel	203
606	KX-F390, Panansonic	239
653	Microcom Deskporte Fast ES 28.8, Microcom	203
654	Motorola UDS FasTalk II 14.4, Motorola	203
676	MultiModem PCS, MultiTech Systems	256
796	PCMCIA fax-modem card, Megahertz	200
655	Practical Peripherals PM288HC II, Practical Peripherals PC144HC; Practical Peripherals	203
656	Supra FaxModem 288i, Supra	203
657	U.S. Robotics Sportster 14,400, U.S. Robotics	203
797	V.34 PCMCIA card, Smart Modular Technologies	200
658	Ven-Tel PCM144Fax, Ven-Tel	203
659	Zoltrix Platinum Internal 14.4, Zoltrix	203
660	Zoom Fax VFP 28.8, Zoom	203

Fax Software

706	Eclipse Fax 6.0, Phoenix Technologies	120

Financial

752	Fidelity's On-line Xpress, Fidelity	216
744	Managing Your Money 1.0 for Windows, Meca Software	210
749	Morningstar Mutual Funds OnFloppy & OnDisc, Morningstar	214
–	Quicken 3.0 for Windows, Quicken Companion 2.0; Intuit	210
746	Retirement Planner, The Vanguard Group	211
745	Retirement Planning Thinkware, Fidelity Investments	211
747	Reuters Money Network for Quicken Users, Reality Technologies	214
751	StreetSmart, Charles Schwab and Company	214
748	The Telescan System, Telescan	214
750	Value Line Value/Screen III, Value Line Software	214

Form Generation

717	Lotus Forms 1.0 for Windows, Lotus Development	108

Groupware

707	CaLANdar 3.0, Microsystems Software	121
705	GroupWise 4.1, WordPerfect	120

Image Editing

712	Photoshop 3.0, Adobe Systems	106
713	Picture Publisher 5.0, Micrografx	106

Input Device

780	ArtPad, Wacom	102
781	PenMouse, Kurta	102
779	Select-Ease Keyboard, Lexmark	102

LAN Application

782	Coactive Connector 2.0, Coactive Computing	68, 121

LAN Operating System

783	LANtastic 6.0, Simply LANtastic 5.1; Artisoft	68
784	Personal NetWare 1.0, Novell	68
785	PowerLAN 3.0, Performance Technology	68
763	PowerLAN 3.1, Performance Technology	124
786	Windows for Workgroups 3.11, Windows NT 3.5; Microsoft	68

Mail Order

719	Acom Patriot 4000, Acom	135
720	Ambra D466I/VL, Ambra Computer	135
721	Ambra D4100I/VL, Ambra Computer	135
738	Ares DX4-100, Ares Microdevelopment	162
722	AT&T Globalyst 200 (486DX2-50), AT&T Global Information Solutions	138
723	AT&T Globalyst 200 (486SX-33), AT&T Global Information Solutions	138
724	Austin P5-66, Austin Computer Systems	138
739	Compaq Deskpro XE 450, Compaq Computer	162
725	Compaq ProLinea 4/100 Model 525, Compaq Computer	142
726	CompuAdd C4100D, CompuAdd	142
727	CompuAdd CP60p, CompuAdd	142
740	DECpc XL560, Digital Equipment	162
728	DECpc XL590, Digital Equipment	146
729	Diamond DT 486-66, Diamond Technologies	146
730	Duracom TravelPro5110, Duracom Computer Systems	146
731	Empac Magnum, Empac Int'l	150
741	Hyundai Neuron Lite 425SX, Hyundai	162
–	IBM ThinkPad 500, IBM	150
732	Identity Systems Select Series, Identity Systems Technology	150
733	Insight PCI P66 SCSI, Insight	150
734	MicroTech Ultima XVC/100, MicroTech Computer	157
735	MIS M5P/60, MIS Computer	157
736	MPC 380, MPC Technologies	157
737	NEC Image 4100es, NEC Technologies	159
742	Wyse Forté GSV, Wyse Technology	162

Miscellaneous

608	CompuSet, Plantronics	239
611	Telescoping Arm, Tandem; Multiform Products	240

Online Service

801	America Online	51, 198, 216
802	CompuServe	51, 198, 216
768	CompuServeCD, CompuServe	117
792	Delphi Internet Services	51, 198
803	Dow Jones News/Retrieval	216
793	GEnie	198
794	MCI Mail	198
804	Prodigy	51, 198, 216

Personal Information Manager

716	Sidekick 1.0 for Windows, Borland	108
757	AnyTime 2.1 for Windows, Individual Software	122
765	Sharkware Professional 2.0 for Windows, CogniTech	124

Printer

776	DECcolorwriter 520ic, Digital Equipment	96
–	Epson Stylus Color, Epson America	96

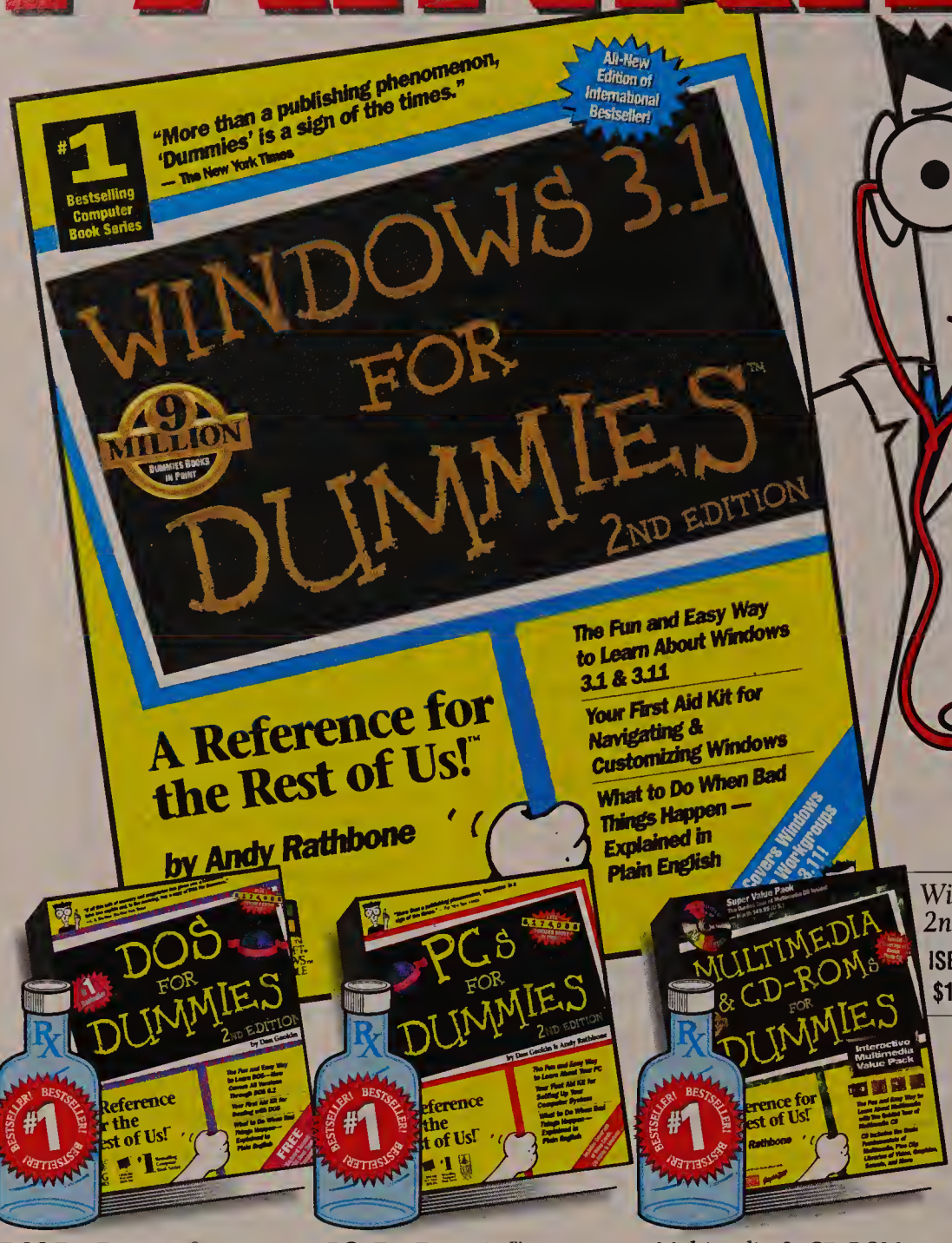
Scanner

609	PaperMax with MaxMate for Windows, Visioneer	240

Utility

766	Carbon Copy 2.5 for Windows, Microcom	124
758	Conversions Plus 2.5 for Windows, DataViz	122
759	DisplayMate for Windows, Sonera Technologies	122
762	Emergency Disk 2.0, SpeedTools 2.0; Central Point Software	122
754	Fileware, Total System Solutions	324
764	Kai's Power Tools 2.0 for Windows, HSC Software	124
715	NoMouse 5.0 for Windows, Abacus Software	107
677	SIP-to-SIMM adapter, JDR Microdevices	256
718	SmartPad 3.0, Softblox	266
607	Stacker 4.0 for Windows, Stac Electronics	239
789	TurboCom/2, TurboCommander; Pacific CommWare	196
753	WOPR, PineCliffe	324

PAINKILLERS!



Introducing

The Fun & Easy Way to Master Windows!

Take the pain out of using Windows with *Windows 3.1 For Dummies*™. Our best-selling *...For Dummies*™ series has helped over 10 MILLION readers learn about computers, operating systems and even the most complex software applications — the fun and easy way!

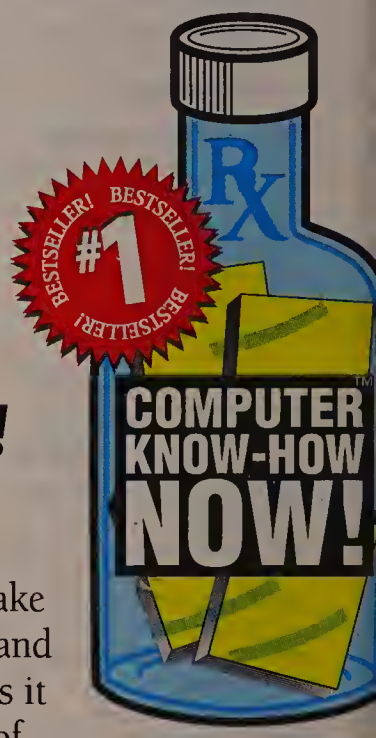
Windows 3.1 For Dummies,™ *2nd Edition*
ISBN: 1-56884-182-5
$16.95 USA/$22.95 Canada

DOS For Dummies,® *2nd Edition*
ISBN: 1-56884-875-4
$16.95 USA/$22.95 Canada
The #1 bestseller just got better! Dan Gookin's revised, expanded and updated "reference for the rest of us" is a perfect reading and learning companion to *Windows 3.1 For Dummies!*

PCs For Dummies,™ *2nd Edition*
ISBN: 1-56884-078-0
$16.95 USA/$22.95 Canada
Suffering computer phobia? This is everyman's prescription for simple computer configuration, upgrading and repair advice. Use it today and get well soon!

Multimedia & CD-ROM For Dummies,™ *with Bonus CD*
ISBN: 1-56884-225-2
$29.95 USA/$39.95 Canada
Learn about sound cards, video cards, software, MIDI connections — what you need and how to integrate it all successfully and painlessly. Our BONUS CD, included with every book, lets you experience the benefits of multimedia firsthand.

The #1 Bestselling Computer Book Series!



There are over 75 *...For Dummies*™ titles designed to help you take control of your PC — and the software that makes it run. To get your copy of *Windows 3.1 For Dummies* or any of our other books call us at 1-800-762-2974 or visit your local bookstore or computer retailer today.

On Sale Now!

Take your pick from over 75 *...For Dummies*™ titles — call us today for our complete catalog. Here are a few samples...

GENERAL COMPUTING	
MORE Windows For Dummies	$19.95 USA/$26.95 Canada
OS/2 For Dummies	$19.95 USA/$26.95 Canada
The Internet For Dummies	$19.95 USA/$26.95 Canada
MORE Internet For Dummies	$19.95 USA/$26.95 Canada
Illustrated Computer Dictionary For Dummies	$12.95 USA/$16.95 Canada
PC HARDWARE	
Modems For Dummies	$19.95 USA/$26.95 Canada
Upgrading and Fixing PCs For Dummies	$19.95 USA/$26.95 Canada
Netware For Dummies	$19.95 USA/$26.95 Canada
SOFTWARE	
WordPerfect 6 For Windows For Dummies	$16.95 USA/$22.95 Canada
WordPerfect For Windows For Dummies	$16.95 USA/$22.95 Canada
Word For Windows 6 For Dummies	$16.95 USA/$22.95 Canada
Excel For Dummies, 2nd Edition	$16.95 USA/$22.95 Canada
Quicken For Windows For Dummies	$16.95 USA/$22.95 Canada
Microsoft Office 4 For Windows For Dummies	$19.95 USA/$26.95 Canada
dBASE For Windows For Dummies	$19.95 USA/$26.95 Canada
FoxPro 2.6 For Windows For Dummies	$19.95 USA/$26.95 Canada
CorelDRAW! 5 For Dummies	$19.95 USA/$26.95 Canada
Access 2 For Dummies	$19.95 USA/$26.95 Canada
Visual Basic 3 For Dummies	$19.95 USA/$26.95 Canada
FOR MACINTOSH TOO!	
Macs For Dummies, 2nd Edition	$19.95 USA/$26.95 Canada
MORE Macs For Dummies	$19.95 USA/$26.95 Canada
Mac Programming For Dummies	$19.95 USA/$26.95 Canada
The Internet For Macs For Dummies	$19.95 USA/$26.95 Canada

FREE T-SHIRT!

Order three or more books today & receive a FREE "Dummies Rule!" t-shirt! Limit 1 per customer.

IDG BOOKS

800-762-2974

In Canada, Call 800-667-1115

PCW994

IDG Books Worldwide, Inc. Order Center: 3250 North Post Rd, Suite 140, Indianapolis, IN 46226 • Tel. 317.895.5200 • Fax. 317.895.5299
...For Dummies and Computer Know How Now are trademarks and IDG Books is a registered trademark of International Data Group.

The Final Frontier, Sam & Max, and That's Not Funny

Most PC game companies are rushing into interactive movies by trying to splash a bit of Hollywood magic over their products with actors and special effects. LucasArts Entertainment, the computer gaming arm of George (*Star Wars*) Lucas, has had its movie thing together for a long time. Sam & Max Hit the Road, the latest CD ROM "talkie" from the California wunderkind, is a charmer.

This postmodern Saturday matinee stars two of the daffiest cartoon characters since That Duck. Sam is an introspective hound dog whose goofy, self-referential dialogue reminds me of *Rocky and Bullwinkle.* His partner Max is really Wambo Wabbit, a buzz saw disguised as a fuzzy bunny. These bozos first appeared in Steve Purcell's underground comic book *Sam & Max: Freelance Police.*

Trixie the Giraffe-Necked Girl

Their big PC adventure has something to do with Bruno the Bigfoot and Trixie the Giraffe-Necked Girl, who have disappeared from Kushman's Carnival, but I didn't pay much attention to the plot. I bet you won't, either. Exploring the landscape with Lucas's new text-free interface is far more fun.

The display is free of an interface bar, so the action unfolds in full-screen graphics. To change your cursor from Use mode to Pick up mode, simply click on a small box in the lower left corner. Then it's back into the action.

You use your mouse to select the *kind* of things Sam and Max say as well—questions, statements, farewells, or goofy non sequiturs—so there's no more typing. If you get the CD ROM edition, you don't even have to bother with reading: Actors speak all the dialogue, including yours. (The CD ROM comes with a free hint book, too.) A floppy-based version uses on-screen text and costs $10 less.

Once you get past the interface and into the game itself, you'll find that it's surprisingly hip: The highway signs for Sartre's Angst Villa flash by so fast you can't quite read them; the boys have their office upstairs from a store that sells "Guns, Liquor, Baby Needs," right across the street from the Really Bad Food hash house. Dancing hamburgers festoon the main game map. Surrealism is alive and well!

The little touches are perfectly done, too: Unlike many games that blast your speakers off the desk, or play so softly you have to exit and reset sound levels manually, Sam & Max provides a three-slider control panel that lets you set the volume for music, voice, and effects independently within the game. Text display speed is also fully adjustable.

If that isn't enough, any time you get bored solving puzzles you can drop out of the plot and play three different mini-games, including the legendary Car Bomb and the ever-popular Wak-A-Rat. You can't get killed—however, you *can* get fatally frustrated.

Beam Me Up, Scotty?

Gene Roddenberry's *Star Trek* series has boldly gone through several generations, but the original version starring Captain Kirk and Mr. Spock still has a host of fans. If you're one of them, you can indulge in a new CD ROM by Interplay, which reinvents the venerable series using full-color animation and dialogue spoken by the original actors. Ask the on-screen Spock for information and not only will he tell you more than you want to know, he'll do it in the emotionless voice of Leonard Nimoy.

The game is painstakingly true to the series. You play Captain Kirk, of course, and your adventures start on the bridge of the USS Enterprise—where you have access to all the familiar communications, weaponry, and personnel. If a Klingon battle cruiser appears, Lieutenant Uhura opens hailing frequencies (assuming it doesn't start shooting first) and relays incoming orders from Starfleet Command. Scotty will wring the last erg of warp power from the engines, and so on. Naturally, you have access to phasers, shields, and photon torpedoes. It's all quite convincing—and in some ways it's a lot more fun than the creaky old TV series.

What do these dancing hamburgers say about subtextual surrealism in Sam & Max Hit the Road?

There are several adventures on this CD ROM, with multiple conclusions depending on how you play your role. The plots run in two modes—on the bridge, and on the surface of the various planets where you attempt to complete your missions. In both locations the interface is a bit unwieldy, requiring more clicking and mousing than I'd like. But once you get the hang of the controls, you can move around, talk to people, fight, defend yourself, use Spock's tricorder, or have McCoy employ his medical kit when needed.

I had a couple frustrating problems

By Michael Goodwin

"THE SHIELDS ARE FAILIN', CAPTAIN!" The fate of the Enterprise hinges on your decisions in Star Trek 25th Anniversary CD ROM.

with the game. For one thing, during space battles with those pesky Klingons, it's almost impossible to figure out where the enemy ships are. The space battles would be more amusing if there were a 360-degree targeting radar. Also, while it was easy to beam down to the surface of planets, I never figured out how to get back. "Beam me up, Scotty! Scotty? Come in, Scotty?"

Stop Me If You've Heard This One

It sounds like a side-splitter: Put 84 people in front of a camera and get them to tell the funniest joke they've ever heard. Unfortunately, too many of the people in filmmaker Brian Ferren's Funny are clueless about what constitutes humor. If this sampling represents their best material, save us from their leftovers!

The CD ROM boasts a complicated interface that theoretically permits you to navigate this ocean of humor, coming to land on just those jokes and joke-tellers you want. But someone seems to have played a funny trick on these guys and switched the index marks around. Ha ha ha! So when you click on the button that's supposed to take you to Frank Zappa telling the joke about New Zealanders who have more than two girlfriends (hard to believe this is the funniest joke Frank Zappa knew), you end up with a female bartender's tasteless joke about ladies of the night.

Aside from jokes that aren't very funny and an interface that doesn't really work, you get a "movie" screen that measures exactly 1.5 by 2 inches. In Texas, the postage stamps are bigger than that.

- **Funny** $24.99; Time Warner Interactive Group; 800/593-6334
  Reader service no. 616
- **Sam & Max Hit the Road** CD ROM version $55.95, floppy disk version $47.95; LucasArts Entertainment Co.; 800/782-7927, 415/721-3300
  Reader service no. 617
- **Star Trek 25th Anniversary CD ROM** $49.95; Interplay; 800/969-4263
  Reader service no. 618

Michael Goodwin is a PC World *contributing editor. He can be reached on PC World Online (see page 10 for contact information).* ■

COMING UP

- **Great Software for Under $50**

Why spend hundreds of dollars for a single application? We uncover more than 50 productivity packages that sell for less than $50 apiece. Products range from font collections to personal information managers. Plus—a few freebies!

- **Finally, Windows Databases for Real People**

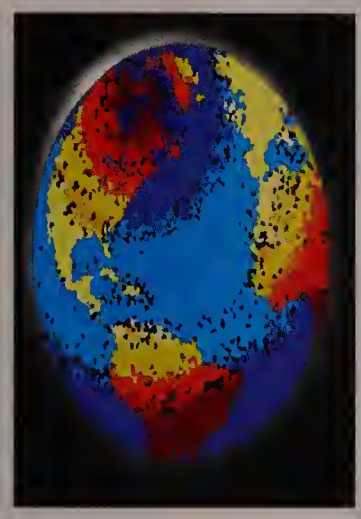
You shouldn't have to be a techno-weenie to create and use a Windows database. Our five-product review helps assess your database needs and reports extensively on usability for readers like you. Is the winner Access? FileMaker Pro? Paradox? Read next month's issue to find out.

Plus:

- **Top Desktop and Mobile PCs—35 Systems Reviewed, More Than Ever Before**
- **Color Printers From $300 to $1499**
- **How to Get Started Telecommuting**
- **Tips on bullets in Word 6.0, Windows for Workgroups offline, and more!**

PC WORLD

Give Us One Day and We'll Give You the World Online.



Online Access®
The Magazine That Makes Modems Work

Chicago	*October 11, 1994, Hotel Inter-Continental*
San Jose	*February 21, 1995, Fairmont Hotel*
New York	*Date and location to be determined*

The online world is exploding. And the Online Access Conferences are here to help you grow along with it.

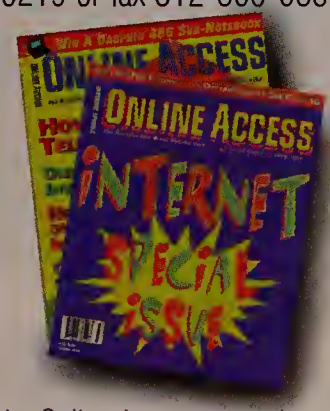
Online Access magazine, **the leading authority on the online world**, brings you the first conferences designed especially to let you experience all aspects of the online world, **hands-on.**

These one day conferences are your introduction to limitless online information opportunities: the Internet, online services, investing, commercial databases, wireless communications, e-mail, BBSs, competitive information and more.

At last, here are conferences that will not only teach you how to go online, but actually show you how and what to do once you get there. *You'll gain the tools you need to work smarter* while learning about online communications first hand.

If you're already a proficient online user, you will have the chance to try out new services, learn advanced competitive intelligence strategies and sample lesser-known databases. You'll also be able to discover more about the Internet, *including how you can put your business up on the 'Net.*

More and more business professionals are finding that to be competitive and stay competitive, they must **learn how to access information fast and efficiently**. Don't let this opportunity to experience and benefit from your future, right now, pass you by. Call 800-291-6219 or fax 312-360-0388 right now.



Sponsored by Online Access magazine. To start your trial subscription, call 800-36-MODEM.*

** You get your first issue absolutely free, plus an additional 10 issues (11 issues in all) for only $29.70 (Canada $34.65, Foreign $87.15, US funds only).*
*** Date and location of Conferences subject to change.*

Sponsored by:

PC WORLD

CHICAGO Online

Mercury Center San Jose

Circle 181 on reader service card

Call 800-291-6219 *8:30-4:30 cst*

There is no obligation!

❑ Please send information about **attending** the Online Access Conference.

❑ Send information about **exhibiting** at the Online Access Conference.

Name _____

Title _____

Company _____

Address _____

City _____ State ____ Zip code _____

Daytime Phone _____ Fax _____ PCWCFS

Send to: Online Access Conference, 330 S. Wells St., Suite 1422, Chicago, IL 60606-7101.

Fax 312-360-0388 / E-mail readoa@aol.com

WinWord Bass-o-Matic

I recently underwent a major transition in life—like birth or unemployment: I changed word processors. I gave up my trusty old copy of DOS WordStar and plunged into Microsoft Word 6.0 for Windows. I've made it through the purgatory of learning the basics and even found some neat features. I love AutoCorrect, which handles my errors with aplomb (*not* aplmob), and Revisions keeps me from duking it out with my editor. I'm getting to like WinWord so much, I want to make it perfect.

What's missing? For one thing, WinWord offers no easy way to save a file to a directory other than the one you're already in. Sure, I could scroll through the dialog box one level at a time, but I said "easy." And how about a quick way to open a list of my favorite templates—minus all Microsoft's packaged wizards—when I open a new document?

To get closer to nirvana, I tried out dozens of add-in tools: some commercial, some shareware, and some free. Each is cleverer than the last, and all slice more than a few minutes from my computing time. I even found one gem that also works with Ami Pro and WordPerfect for Windows.

Whopper of a Program

For sheer comprehensiveness, nothing beats PineCliffe's WOPR (pronounced "whopper"). For starters, this $49.95 shareware package gives me a real file manager right inside WinWord. Not only can I copy, rename, and delete files, I can jump quickly into my most frequently used directories. WOPR also lets me create and choose from a set of custom file types, making it easy for me to find my old WordStar files. WOPR adds its own commands to the File menu, including a Save As with all the trimmings, and a New File with a customizable list of favorite templates.

WOPR also helps WinWord catch my mistakes. With a click of the right mouse button, WOPR checks the current word's spelling. That's good, but what's great is that I can hold down <Ctrl> to add the misspelling—and its correction—to Word's AutoCorrect list. Stellar Speller is also smarter than Word's spell checker. For example, Word objects to 'misspelling- -,' while Stellar Speller knows enough to ignore the '- -'. I can also get to the thesaurus while I'm editing with the mouse.

What else is there to say? I was enamored of Word's Envelope feature until I loaded WOPR's Enveloper. Now I get to choose from multiple return addresses, add graphics, change fonts, and place messages on the envelope's lower left corner. Another nice feature: When I bring up WinWord's Edit•Replace dialog box, WOPR pops the currently selected text into the Find What text box. Curiously, WOPR doesn't do this for a simple Edit•Find, but it does let me skip quickly forward or backward in my search. And if you don't like a specific feature, WOPR uninstalls it, something I wish more products would do.

Download a copy—WOPR60.ZIP—from PC World Online (see page 10 for more information), or just call PineCliffe directly. • *WOPR $49.95; PineCliffe Int'l; 800/659-4696, 314/965-5630. Reader service no. 753*

I also found other worthwhile WinWord add-ins, three of which I've uploaded to PC World Online. At the low end of the price range (free) are Directory Changer (WRDR06.EXE), for jumping quickly between your eight favorite directories, and FileDelete (WDDEL.ZIP), which does just what the name implies. (George Campbell discussed FileDelete in June's *Word Processing*.) For a bit more money, FileWare manages your files and lets you substitute one font for another globally (FW3W6.ZIP). • *Fileware $39.95; Total System Solutions; 800/814-2300, 718/375-6261 (fax). Reader service no. 754*

Ultimate Mail Merge

I send out a lot of mailings, and having a database program like Office Accelerator tied to my word processor is a big convenience. This add-in goes way beyond WinWord's mail merge, letting me store 32,000 names, each with ten phone numbers and addresses, various search keys, and 16 pages of notes. Besides handling mass mailings and faxes, it can also drop an address into a single letter and dial phone numbers.

Office Accelerator also works with WordPerfect for Windows and Ami Pro. It's a commercial program, so I can't put it on PC World Online without getting arrested. But, I've seen it discounted to $50. • *Office Accelerator $99.95; Baseline Data Systems; 800/429-5325, 310/214-8529 (fax). Reader service no. 755*

Now if only an add-in could give WinWord the WordStar key commands.

Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached on PC World Online (see page 10 for contact information).

By Steve Bass

BUD PEEN

BETTER FEATURES.

BETTER PRICE.

BETTER CHECK IT OUT.

New Dell® Latitude™ 33MHz SX

$1999

Business Lease: $74/Mo.

- 4MB RAM
- 200MB Hard Drive
- 9.5" Dual Scan STN Color Display

Order Code #600009

New Dell Latitude 50MHz DX2™

$2499

Business Lease: $93/MO.

- 4MB RAM
- 340MB Hard Drive
- 9.5" Dual Scan STN Color Display

Order Code #600010

COMMON FEATURES

Speed & Graphics

- DX/2 and SX SL-enhanced Processors
- 32-bit Local Bus Video/1MB VRAM

Flexibility & Modularity

- 1 Type III/2 Type II PCMCIA Slots
- Removable 3.5" Floppy Replaceable with Second Battery
- 8+ Hours of Battery Life with Two Batteries† (Extra battery $99)

Ready-To-Run

- MS-DOS 6.2/Windows 3.1
- CommWorks
- America OnLine/RadioMail

THE NEW DELL LATITUDE 8 HOUR BATTERY LIFE ONLY $2098

INCLUDES $99 OPTIONAL SECOND BATTERY.

DELL™

To Order, Call

800-433-8093

In Canada‡ Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

Keycode #11DDC

AS USUAL, THE LOWEST PRICES ARE IN THE BACK OF THE MAGAZINE.

90MHz PENTIUM MINI TOWER

Dell Dimension XPS P90 Mini Tower

A Pentium Based 90MHz System

- Mini Tower Chassis
- 16MB RAM
- 1GB Enhanced IDE Hard Drive (10ms)
- VS17 Monitor (17" CRT, NI)
- 64-Bit #9 PCI 2MB VRAM Video Card
- NEC 3X CD ROM Drive (450KB/Sec. Transfer Rate)
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$3899

Business Lease: $140/Mo.

Order Code #500026

90MHz PENTIUM BEST BUY

Dell Dimension XPS P90 Mini Tower

A Pentium Based 90MHz System

- Mini Tower Chassis
- 8MB RAM
- 1GB Enhanced IDE Hard Drive (10ms)
- VS15 Monitor (15" CRT, NI)
- 64-Bit #9 PCI 2MB VRAM Video Card
- 2X Multi-session CD ROM Drive
- 256KB External Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$2999

Business Lease:$111/MO.

Order Code #500025

LOADED P60

Dell Dimension XPS P60

A Pentium Based 60MHz System

- 8MB RAM
- 528MB Hard Drive (12ms)
- VS15 Monitor (15" CRT, NI)
- PCI Video Card With 1MB VRAM
- 2X Multi-session CD ROM Drive
- Soundblaster 16 Sound Card
- Peavey® 240 Bi-Amplified 2-Way Speakers
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$2499

Business Lease:$92/MO.

Order Code #500029

MULTIMEDIA/MS OFFICE

Dell Dimension 466V Intel® DX2 66MHz System

- 8MB RAM
- 528MB Hard Drive (12ms)
- VS15 Monitor (15" CRT, NI)
- Accelerated Local Bus Video
- 2X Multi-session CD ROM Drive
- Soundblaster 16 Sound Card
- Peavey 200 Speakers
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS Office, Bookshelf, Quicken
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$2199

Business Lease:$81/MO.

Order Code #300030

60MHz PENTIUM UNDER $2000

Dell Dimension XPS P60

A Pentium Based 60MHz System

- 8MB RAM
- 340MB Hard Drive (13ms)
- VS15 Monitor (15" CRT, NI)
- PCI Video Card With 1MB Video RAM
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Pictured system

$1999

Business Lease:$74/MO.

Order Code #500023

66DX2 PROCESSOR

Dell Dimension 466V Intel DX2 66MHz System

- 8MB RAM
- 340MB Hard Drive (13ms)
- VS15 Monitor (15" CRT, NI)
- Accelerated Local Bus Video
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$1599

Business Lease:$59/MO.

Order Code #300019

33SX PROCESSOR

Dell Dimension 433SV Intel SX 33MHz System

- 4MB RAM
- 340MB Hard Drive (13ms)
- VGA 800 Monitor (14" CRT)
- Accelerated Local Bus Video
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

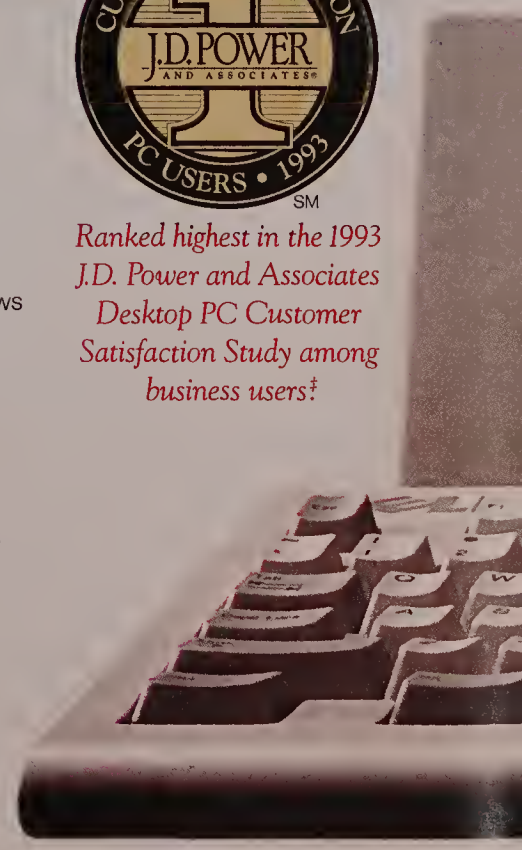
$1099

Business Lease:$41/MO.

Order Code #300038

CUSTOMER SATISFACTION #1 J.D. POWER AND ASSOCIATES PC USERS • 1993 SM

Ranked highest in the 1993 J.D. Power and Associates Desktop PC Customer Satisfaction Study among business users‡



DELL™

To Order, Call

800-433-8094

In Canada†, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

Keycode #11DDD

†Latitude is powered by NiMH battery with an option of replac

‡1993 J.D. Power and Associates Desktop Personal Compu

U.S. Prices and specifications subject to change without noti

trademark and Windows is a trademark of Microsoft Corpora

floppy drive with a second NiMH battery. Independent battery life test performed by VeriTest. Testing included both Steeplechase and Sprint testing. For a complete copy of the VeriTest report, please call 1-800-BUY-DELL. Satisfaction Study conducted among 1,956 business user respondents. ◊Business leasing arranged by Leasing Group, Inc. ★Prices valid in the U.S. only. Some products and promotions may not be available outside the The Intel Inside and Pentium Processor logos, Pentium, DX2 and SX2 are trademarks of Intel Corporation. Peavey is a registered trademark of Peavey Electronics Corporation. MS-DOS and Microsoft are a registered . Fortune 500 is a registered trademark of the Time Inc. Magazine Company. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.

IT'S A SMALL PRICE TO PAY FOR POWER.

90MHz PENTIUM
2X CD ROM AND PCI LOCAL BUS VIDEO
ONLY $2599

INSIDE YOU'LL FIND EVEN MORE EVERYDAY LOW PRICES.

Dell Dimension™ XPS P90 Mini Tower
A Pentium™ Based 90MHz System

$2599

Business Lease◊: $109/MO.

SYSTEM SPECS:
- Mini Tower Chassis
- 8MB RAM
- 540MB Hard Drive
- VS15 Monitor (15" CRT, NI)
- PCI Video Card With 1MB VRAM
- 2X Multi-session CD ROM Drive
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- SpaceSaver Keyboard
- MS-DOS® 6.2/Microsoft® Windows™ 3.1/Mouse

Order Code #500024

DELL SPECS: Besides everyday low prices on PCs, Dell gives you the support of a FORTUNE 500® company with nearly $3 billion in annual sales. In fact, since our birth ten years ago, we've become one of the top five PC companies worldwide.

intel inside
pentium PROCESSOR

DELL™

To Order, Call

800-433-8089

In Canada, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

Keycode #11DJ4